

DIESEL PROGRESS



JUNE, 1943

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FOR ALL DIESEL ENGINES

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

DIESEL PROGRESS, for June, 1943. Volume IX, Number 6. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 West Forty-fifth Street, New York, N. Y. Rex. W. Wadman, President. Acceptance under the Act of June 5, 1934, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: \$5.00 per year, single copy 50c.

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FRONT COVER ILLUSTRATION: U.S.S. Dominant, a Diesel Coastal Minesweeper. Official Navy Photograph.

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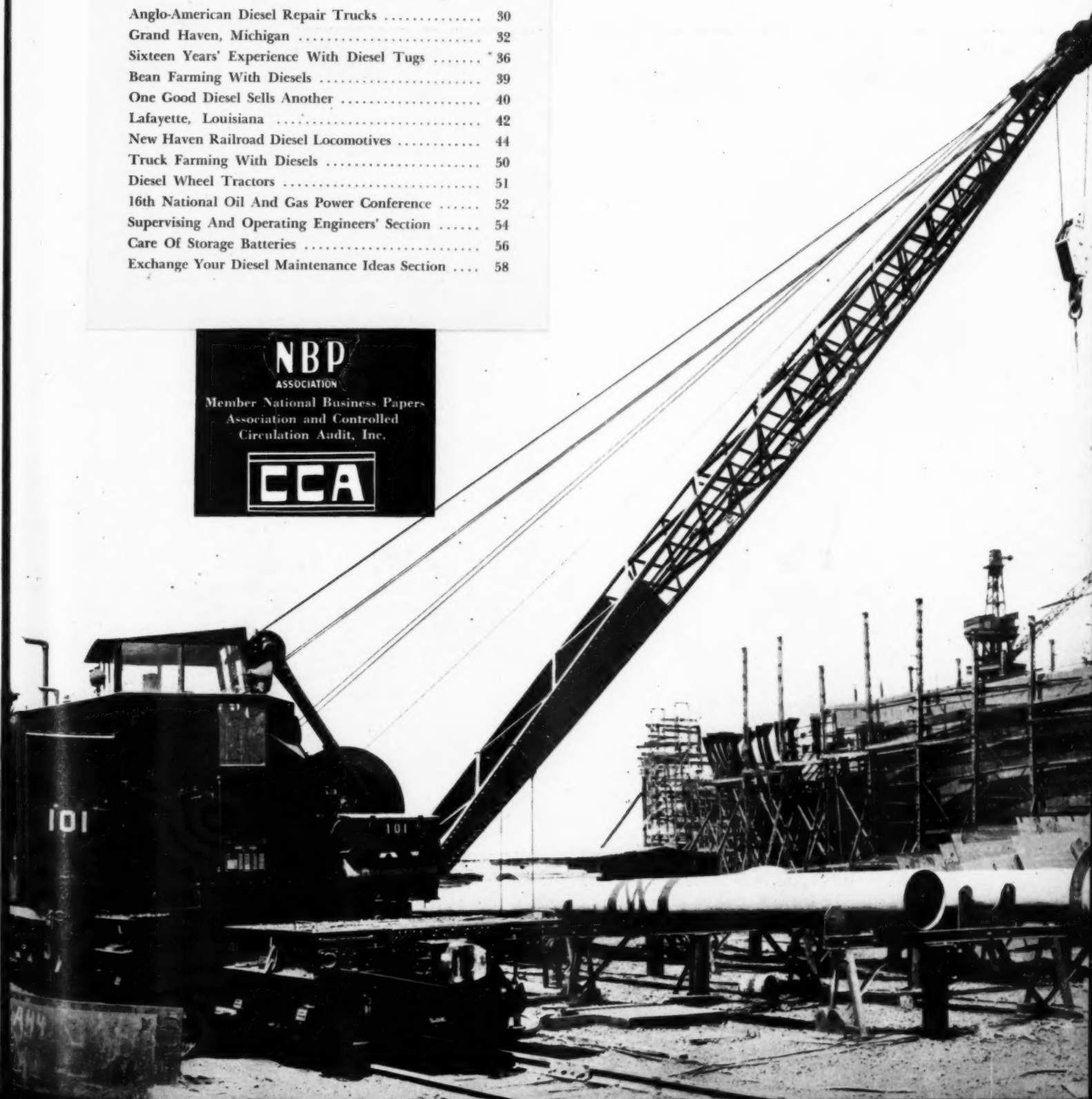
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DIESEL *and* GAS ENGINE PROGRESS



AMERICAN GENERAL

INSPECTS ANGLO-AMERICAN MADE

DIESEL REPAIR TRUCKS

RELEASED AT HEADQUARTERS, EUROPEAN THEATER OF OPERATIONS, UNITED STATES ARMY

"LET'S hope that this work is indicative of what we'll be able to do together from now on," declared Major General John C. H. Lee, United States Army, at a formal inspection recently of American-designed, British-built railway wrecking trucks which will be used by both armies. Directing his remark to the British chief mechanical engineer, who is in charge of the construction of the repair trucks at shops somewhere in England, General Lee also expressed high approval of these big 10-ton Diesel-engined vans. The American official is Commanding General of the Services of Supply, United States Army, in the European Theater of Operations.

Designed by two United States Army officers, several of these trucks have been completed, and more are on the way for use with both British and American Army railway units. They have been constructed "with the specific purpose of overcoming certain practical difficulties confronting military railway operation."

Colonel Norman A. Ryan and Major S. H. Bingham are the American officers responsible for designing the "breakdown lorries," as the British term the mobile railway repair unit. Colonel Ryan is acting chief of the Transportation Corps in the European Theater of Operations, while Major Bingham is the officer in charge of military railways for the Transportation Corps.

The wrecking van has a threefold value in meeting some of the difficulties that arise in military transport repair work. First, conventional heavy wrecking equipment cannot be

readily obtained in the European Theater. Since the trucks are built to be used on any future operations, it is essential to have wrecking equipment so provided as to meet quick-shipping and mobility requirements. Secondly, most derailments or wrecks occur on single military lines, and make difficult the dispatch of wrecking trains. The truck has the decided advantage of readily accomplishing cross-country travel. And finally, it provides easy access to repair work on the many derailments that occur in yards and at track junctions where cranes cannot be easily operated.

Because of high power requirements, Diesel engines are used in the wrecking trucks. The 10-ton vehicle is provided with a British-made Foden chassis which has a low center of gravity essential to rugged, cross-country travel. All equipment is designed so as to be portable by two men "in the event that access to the scene of trouble is not possible to the truck itself." Tools and equipment are all racked inside the van body and the shape of each is painted in silhouette so as to assure correct replacement. Hooks for a tow line are attached to the front and rear of the frame. General Lee, upon first observing the neatly racked tools in one of the vans, smiled broadly and exclaimed: "A place for everything—and everything in its place!"

And the van does include a surprising variety of repair material—more than 40 different types of tools and equipment. Each carries blocks and tackle, slings, rope, pinching bars, hammers, punches, wrenches, vices, axes and a variety of lesser implements. Lifting and tra-



Maj. Gen. John C. H. Lee (center) and his aides inspect the railway wrecking lorry, built in London for the U. S. Army.

ALL PHOTOGRAPHS PASSED AS CENSORABLE BY UNITED STATES ARMY

versing jacks, as well as the hydraulic and screw-type are stocked. Besides an assortment of buckets, ladders, oxy-acetylene torches and illuminating lamps, there is rubber-proofed clothing for work on electrified lines where insulation is necessary to the repairmen.

A driver and helper occupy the truck cab, while a compartment immediately behind provides space for six more men. Special training is at present being given certain United States troops in preparation for their becoming maintenance and operating crews for the vehicles. Men who work with the truck will not use it for sleeping quarters, but will be attached to a railway operating company.

"This type of repair truck has been used in both New York and London subway systems previous to the war and with good results," explained Major Bingham. "It was also very useful for quick servicing during the Battle of Britain. Only about one in twenty derailments call for the use of heavy, rail-operated cranes, and many times the situation is such that the crane repair work can't be carried out. It is here the truck comes in as constant and useful help," the Major added. "We have one operating under American personnel in Africa now, but there has been no report on it as yet. But I'm sure it is proving its worth," he said.

Above: Maj. Gen. John C. H. Lee, on the left, and his aides inspect the railway wrecking lorry, built in London for the U. S. Army.



Above: Major S. H. Bingham, New York, N. Y., beside the railway wrecking lorry which he designed. Below: Maj. Gen. John C. H. Lee (right) and Col. Norman A. Ryan inspecting a lorry.

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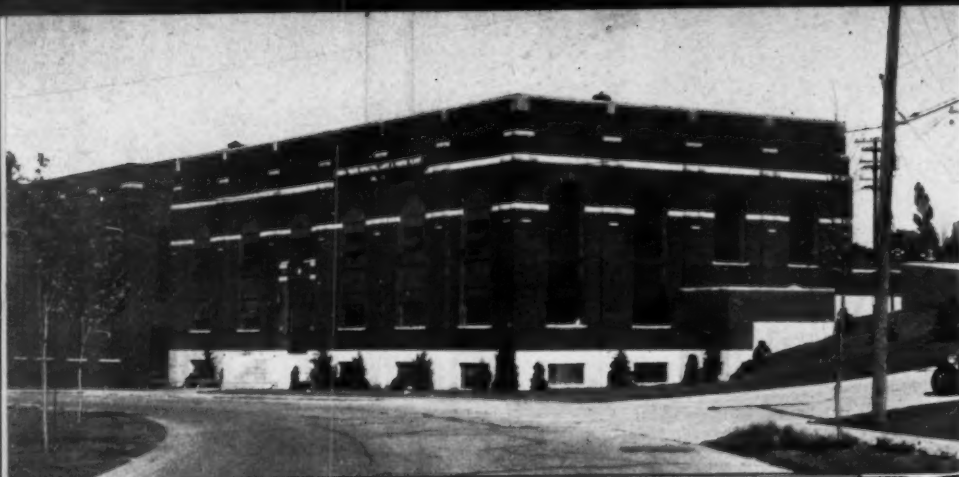
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Above: Maj. Gen. John C. H. Lee (right) congratulates Major S. H. Bingham of New York, on his design of the railway break-down lorry. Standing in the center is Col. Norman A. Ryan, Washington, D. C., head of Military Transportation. Right: Closeup of the Diesel engined railway wrecking lorry being built in England to American designs.

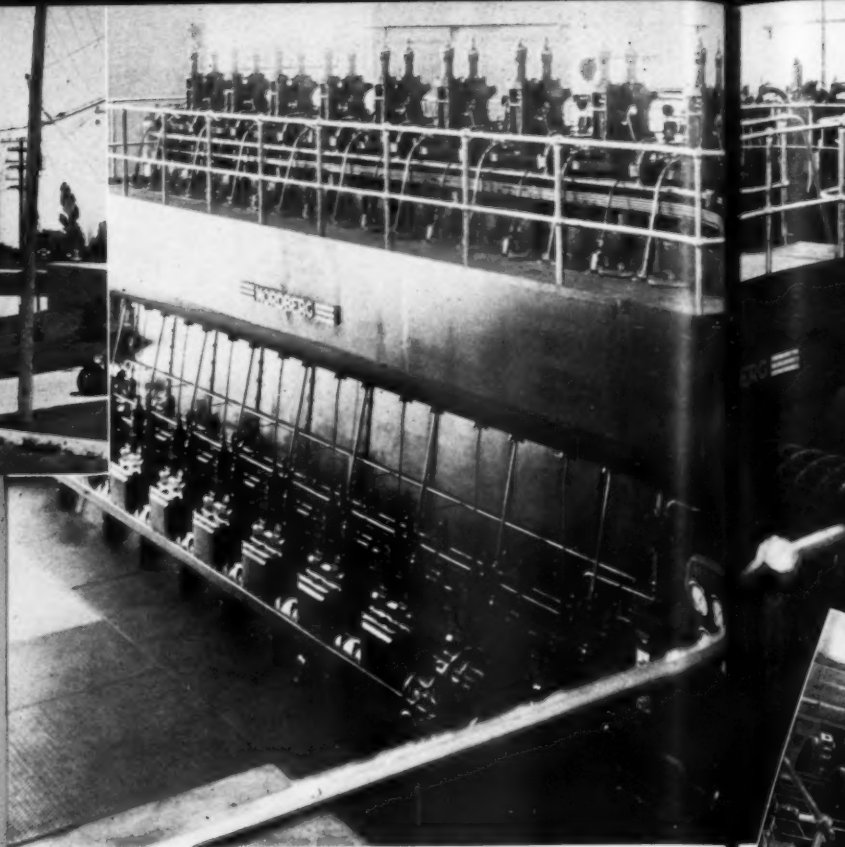




General view of the Grand Haven, Michigan Power Plant showing the Diesel plant in the foreground.

GRAND HAVEN, MICHIGAN INSTALLS ITS FIFTH BIG DIESEL

By J. BRYAN SIMS*



Partial view of the engine room showing the new, 9-cylinder, 3850 bhp. Nordberg Diesel in the foreground.

THE City of Grand Haven, Michigan, has recently put into operation its fifth Diesel engine-generating unit, a 3850 bhp. engine direct connected to a 3390 kva., 6900-7200 volt generator. These five engines have been installed at various times during the past twelve years to supplement a 3000 kw., 150 lb. steam turbine generating plant.

Grand Haven is located in Western Michigan at the mouth of Grand River where it flows into Lake Michigan, at a point less than 200 miles up the lake shore from Chicago. It was known many years ago principally for its lumbering activities, and has always been noted for its very excellent harbor. Today this community possesses a well diversified manufacturing industry, and is a summer resort town boasting of one of the finest natural sand beaches in the country. Thousands of summer visitors come here annually to enjoy the cool lake breeze. There is a substantial summer colony from Detroit, Chicago, St. Louis and Grand Rapids, and the addition of this seasonal residential electric load greatly assists in leveling out the annual load curve at the plant.

In addition to serving Grand Haven with electric power, the plant also serves the small town of Ferrysburg across the river to the north, whose principal industry is a boiler manufacturing concern. Several rural lines extend in different directions and reach out as far as six

* Superintendent, Board of Public Works, Grand Haven, Michigan.

miles. The majority of these rural lines were built several years ago, prior to the more recent activity over the country in rural line construction. Thus, it might be said that Grand Haven was a pioneer in the extension of city lines into rural districts.

Among the larger industrial users of electricity, are plants normally manufacturing pianos, radio cabinets, printing machinery, automotive mufflers, pneumatic tools, novelties, plumbing goods, marine engines, gloves, boilers, enameled products, screw machine specialties, leather goods, soda fountains and many other highly essential items.

This municipally-owned electric utility plant, established in 1896, has had a long and interesting history. It generates and supplies all current for the local manufacturing plants, except the large leather tannery which generates part of its requirements due to the necessity for process steam. It is interconnected with the tannery with approximately 600 kva. capacity, as the power requirements of this manufacturer, particularly during the summer months, are considerably more than the normal steam demand.

Probably one of the most interesting features of the new 3850 bhp. unit is that it occupies a space originally planned in 1937 for a 2250 hp., 2 cycle unit. At that time a fourth engine, a 2250 hp. Nordberg engine-Elliott generator unit, was installed and sufficient space

provided for another engine of the same size. Prior to this, in 1934, a 1140 hp., 4 cycle DeLaVergne engine and 1000 kva. Elliott generator were installed to supplement two engine-generator units of the same specifications which constituted the original Diesel plant built in 1929-30. Much thought and considerable rearranging of existing equipment was necessary in order to install the new engine in the space available, as it is 52 ft. 7 in. overall in length, and weighs approximately 250 tons. The complete foundation consists of over 500 cu. yds. of reinforced concrete.

In order to construct the foundation for the new 3850 bhp. unit, it was necessary to shore and underpin the foundation of the adjacent 1140 hp. DeLaVergne engine which had relatively small spread to its footing and was only 22 in. deep under the basement floor. The underlying soil is Ottawa sand, which offers a satisfactory footing if properly retained, but the wood sheeting which had been used and left in place had dry rotted and a considerable movement in the foundation resulted. Steel interlocking sheet piling was driven, and the foundation was shored while excavation and pouring of the new engine foundation was being completed. Later the old foundation was underpinned and existing voids filled with pressure grouting. This greatly stabilized it and prevented it disturbing the new engine foundation which has considerably more spread to its footing and extends 6 ft. deeper into the sand. The total soil loading on the new

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The operation of the plant is somewhat unusual in that the base load is handled by the Diesel plant with the less efficient steam plant used as standby and reserve. Piping is so arranged that hot jacket water, which has been previously softened by Zeolite softeners, may be used for power boiler and waste heat boiler water make up.

Air intake for the new unit is through an outside concrete filter house provided with an American automatic self-cleaning air filter of 23,300 cfm. capacity, thence through a 66 in. by 170 in. Burgess intake snubber into the tunnel provided for air passage inside the engine foundation and on up into the large Roots


the jackets by using surge tanks located on the third floor gallery. Four 60 cu. ft. air tanks for starting air supply to the new engine are also located on this gallery, as are 500-gallon conical bottom oil storage tanks. Some of these tanks store centrifuged fuel oil and are equipped with steam coils for preheating. A number of other tanks store distillate for starting the engines, and reclaimed lubricating oil for crank cases. Youngstown Miller batch purifiers and Honan-Crane continuous purifiers are used to clean lubricating oil, and centrifuges are used occasionally for removing sludge and water.

An additional motor driven Worthington 2-stage starting air compressor of 80 cfm., which is a duplicate of one installed several years ago, provides additional starting air for all engines. An emergency gasoline driven starting air compressor is available, although fortunately it has never been necessary to use it. A new auxiliary air compressor, a Gardner-Denver, 5" x 1 7/8" x 4", 15 cfm. at 1000 lbs. pressure is installed to provide air for injection in event of loss of air pressure normally furnished by the direct driven blast air compressor.

The new engine, having oil cooled piston heads and full forced feed lubrication, utilizes a direct driven lubricating oil pump located in the sump. An auxiliary Blackmer 360 gpm. pump driven by a 20 hp. motor for use while starting the engine is located in the basement.

Due to the restricted space available and in order to reduce the amount of piping, all auxiliaries are located as compactly as possible. All lubricating oil and soft and raw water piping is of welded fabrication, few flanged and bolted fittings being used except at the valves. Raw cooling water piping is arranged to allow the backwashing of lubricating oil cooler and jacket water heat exchanger. In the past this has proved desirable, due to the silt deposited from the river water during certain seasons of the year. Backwashing is done from city watermains at approximately 80 to 90 lbs. pressure, whereas the normal pressure of the raw water is 50-55 lbs.

Fuel oil, the majority of which is purchased from nearby Michigan refineries, is a heavy residual from topped crude. It can be received by truck, railroad or boat and is stored in underground steel tanks of substantial capacity adjacent to the plant. All fuel received is metered by a 3 in. Pittsburgh meter with air release, and before centrifuging in Sharples centrifuges is preheated by an exhaust heater on the 2250 hp. engine. When this engine is



In this view are seen, first the 3850 bhp. Nordberg Diesel and Allis Chalmers generator, with three, 1140 bhp. DeLaVergne Diesels and Elliott generators in the background.

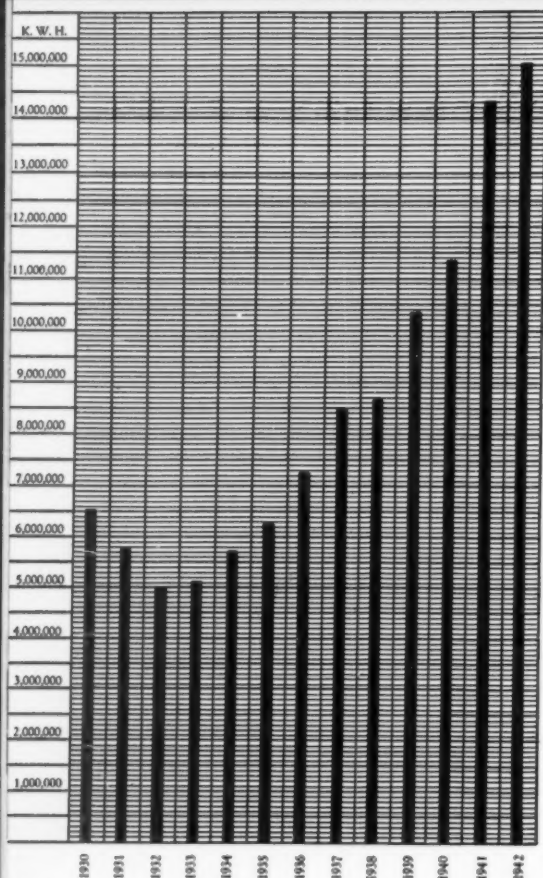
unit is approximately 1 1/4 tons per sq. ft. which is not excessive for this type formation.

The new engine exhausts into a 1836 sq. ft. Foster Wheeler waste heat boiler, thence into a Burgess auxiliary snubber 79 in. in diameter by 208 in. in length, and into the base of the 175 ft. Weber concrete chimney which also serves the steam plant. The Diesel exhaust runs in steel pipe up inside the chimney to a point above the boiler breeching. Steam from the waste heat boiler supplies the heating system and will keep a 25 lb. pressure on the power boilers and steam plant piping to assist in getting the steam plant on the line more quickly when it is not in use and the boilers are not banked. These power boilers are stoker fired, and have small supplementary oil burners for starting a fire and to enable the operating crew to put the boilers into operation within a short time.

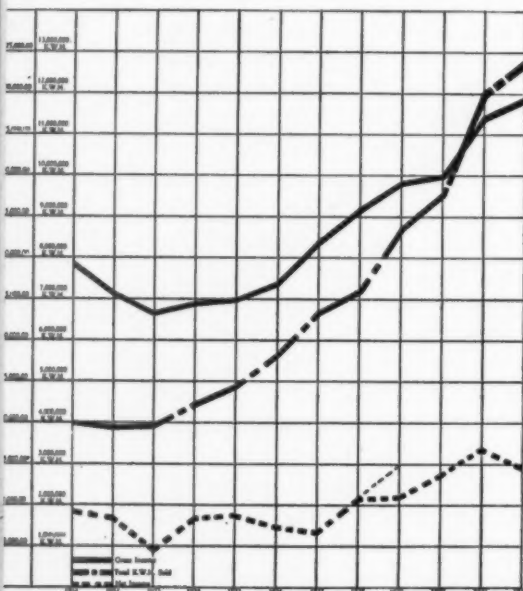
scavenger blower which is mounted on the engine and driven through gears.

Raw cooling water is taken from Grand River through a concrete pipe intake tunnel into an underground screen and pump house where it is pumped across the road in a 12 in. cast iron pipe line to the power plant by two 1200 gpm. and one 700 gpm. Peerless well pumps. This water is piped to heat exchangers and oil coolers for all engines.

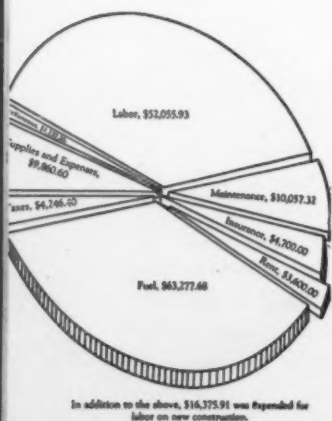
The jacket water heat exchanger on the new unit is a Griscom-Russell, 2-pass with 792 sq. ft. of surface, and the oil cooler is of the same manufacture, with 1590 sq. ft. of surface. Motor driven 460 gpm. Allis-Chalmers unit pumps circulate softened jacket water. Soft water for jacket water make up is obtained from Zeolite softeners in the steam plant, and a constant head of soft water is maintained on



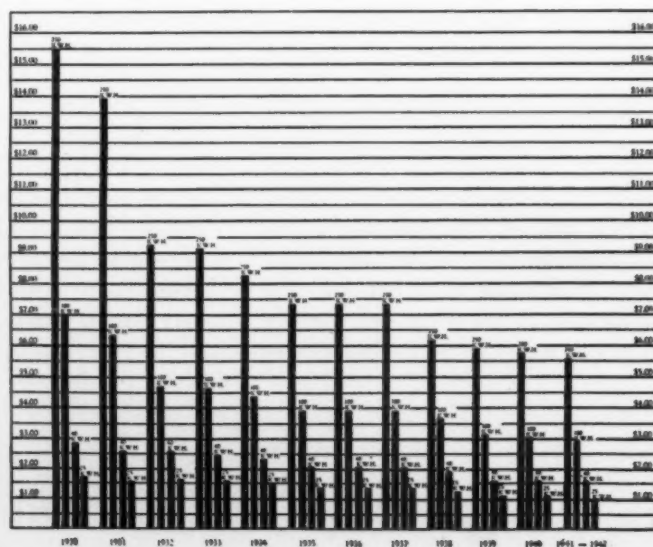
Graph of kilowatt load growth since 1930. Comparison of kwh. sold with gross and net revenues.



Cost of 25, 40, 100 or 250 kwh. to domestic users since 1930.



Graph showing relative operating expenditures of the system for the fiscal year.



not running, an electric heater is used to pre-heat the fuel to approximately 100°F., this being the temperature at which it has been found most desirable to centrifuge oil due to its wax content and other characteristics. The fuel oil then goes to the heated conical bottom tanks where it rests, and any water or sediment not previously removed by centrifuge settles out.

From these tanks the fuel flows by gravity to individual engine metering and preheating tanks in the basement. The tanks are equipped with steam or hot water coils, and a supplementary electric immersion heater controlled by thermostat. A Nugent duplex filter is located between the metering tank and the engine. All heavy fuel oil piping is covered with asbestos air cell insulation and heated with soil heating cables to insure a continuous flow of oil. All engines are started and shut down on distillate to facilitate easy starting. Experience with the various types of heavy fuel burned over the past few years has given ample opportunity to observe the most satisfactory temperatures for the preheating of heavy fuel oil.

The plant owns complete laboratory equipment for testing fuel oil, including viscosimeter, centrifuge, carbon residue crucibles, open cup flash and fire test equipment etc. The city chemist analyzes fuel and lubricating oil.

The new unit is a 9 cylinder, 225 rpm., 21½ in. bore by 31 in. stroke Nordberg Diesel cross-head construction, with a piston speed of 1163 ft. per minute using improved air injection control. The 1000 to 1200 lb. operating pressure injection air is furnished by a 3-stage compressor driven off the main crank shaft. American Bosch fuel pumps supply fuel to atomizer or injection nozzles, the needle valve

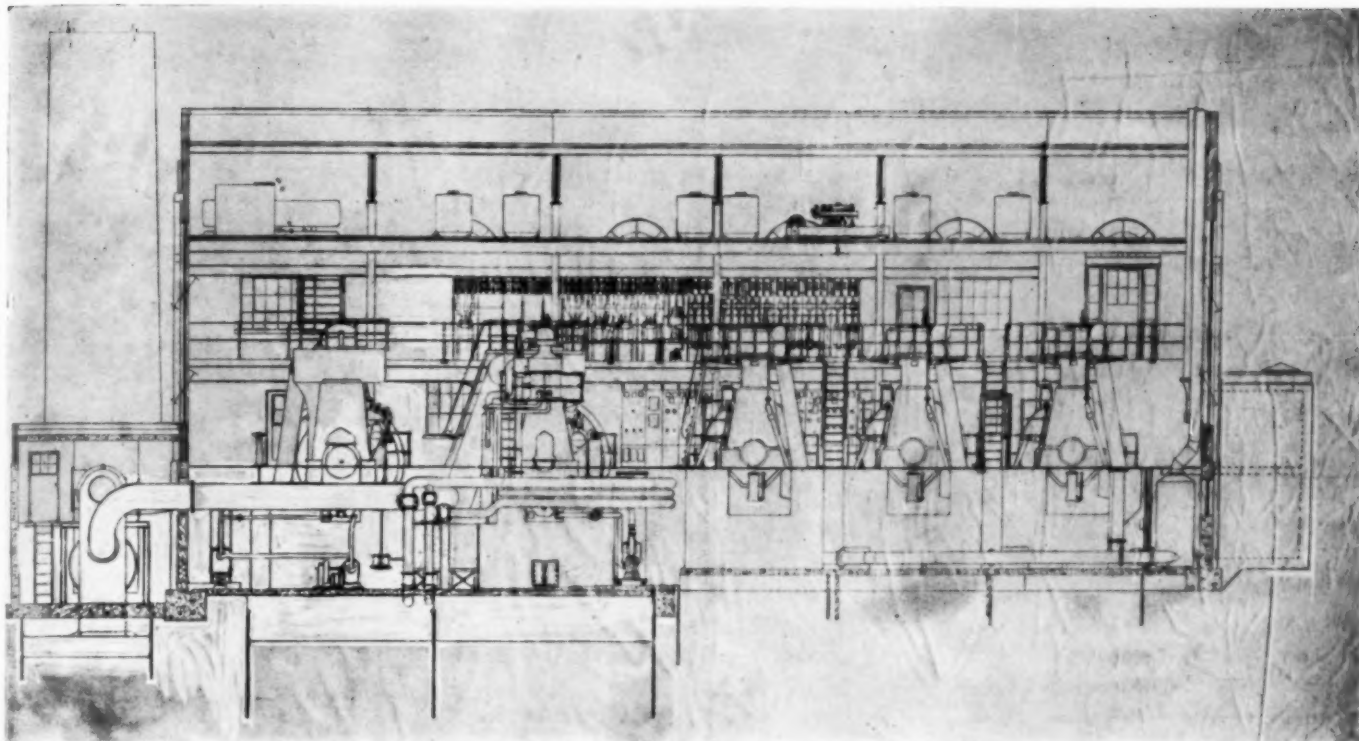
mechanisms of which are operated by oil filled hydraulic actuators in lieu of push rods. Smaller American Bosch pumps, operating off the same cam shaft as the fuel pumps, pump the oil to the actuators which operate the needle valves of the injection nozzles. The Woodward governor controls not only the fuel pumps but also the actuator pumps which gives closer control over fuel injection than was heretofore possible with push rod non-controlled needle valves. The governor also controls a regulating valve supplying the high pressure injection air to the fuel nozzles. The engine is equipped with individual Manzel lubricators for each power cylinder and for the air compressor. Special lighting has been installed on these lubricators for the convenience of the operating engineer.

The generator, manufactured by the Allis-Chalmers Mfg. Company, is of all-welded construction. The heavy flange to which the fields are bolted is of forged construction carrying considerable weight. The arms are welded to the solid disc, with built up hub keyed to the stub shaft. Probably the most interesting feature of the generator is the manner in which the cooling air is handled. All air is taken from the outboard bearing end and discharged out through the center of the stator. No cooling air is taken from the end of the generator nearest the engine. Previous generator applications on Diesel engines draw air from both ends of the generator and tended to make it difficult to prevent some oil from seeping out along the crank shaft journal and soaking the generator windings.

The new generator is rated at 3390 kva., 80 per cent power factor, 40°C. rise, and operates at from 6900 to 7200 volts. The exciter is Vee belt driven off the generator stub shaft.

Due to the fact that three of the previously installed Diesel units are 4 cycle and the other two are 2 cycle, considerable study was given to the paralleling characteristics of the five units operating together. It was decided to build part of the WR² considered necessary into a separate flywheel in addition to the substantial amount included in the generator.

Diesel engine generators Nos. 1, 2, 3 and 5 generate at 2400 volts, 3 phase, 60 cycles onto a common bus with solenoid operated oil circuit breakers located on the second floor gallery. This bus is inter-connected with the 2 phase, 2400 volt steam plant through a 2000 kva. Scott connection auto-transformer bank located in a steel substation structure outside



Elevation of the Grand Haven, Michigan Diesel generating plant, showing arrangement of the five engines.

the plant. The commercial and residential feeder circuits are 2400 volt, and go out of the plant using 5000 volt insulated lead covered 250,000 C.M. cables in fibre ducts underground. The industrial power load is served by a higher voltage loop of approximately 7200 volts fed from a 2500 kva. step-up bank.

Due to the fact that the majority of the load carried by the new unit will be daytime peaks of industrial power, it was decided to build the new machine for the higher voltage and feed directly into the 7200 volt industrial loop.

This would reduce the copper loss of transformation and increase the available industrial power at 7200 volts without the necessity of adding transformer capacity and another 2400 volt, two million circular mill feeder. It would also reduce the 2400 volt oil circuit breaker short circuit interrupting capacity necessary due to the reactance of the 2500 kva. bank of transformers.

The oil circuit breaker of the new generator was manufactured by the Pacific Electric Mfg. Company. It is rated at 400 amp., 7500 volts, 50-70,000 kva. interrupting capacity, and was installed outside the plant in the steel substation structure with breakers of the same specifications placed in the loop feeders and also on the 7200 volt side of the 2500 kva. transformer bank. This former feeder circuit to the loop thus, in effect, becomes a bus tie. The generator feeds out through a steel cubicle located in the basement which also con-

tains double secondary current transformers for generator differential protection and metering, together with three General Electric Thyrite lightning arresters and three capacitors.

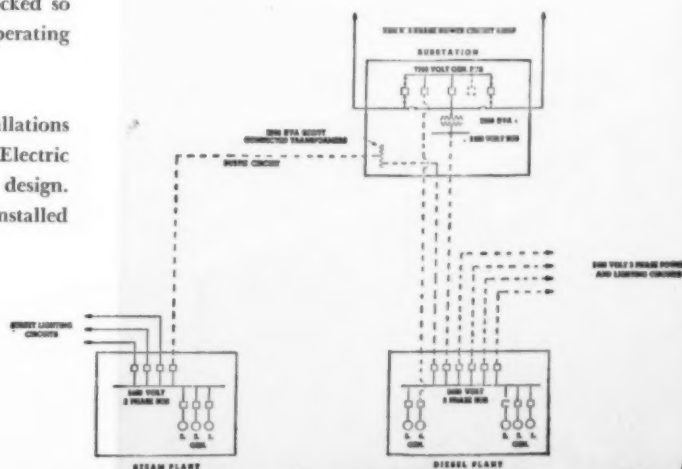
An enclosed solenoid operated generator field switch is mounted nearby. The cubicle sets at the end of the generator foundation in the basement, and was designed and wired on the job. A recent experience, wherein lightning came in on a generator and the operator was slow getting the excitation off the field resulting in a more severe generator damage than would have been the case had the generator been equipped with differential protection, has proven the justification for this type of automatic equipment, even in the smaller capacity generating plant.

A General Electric generator voltage regulator is installed on the switchboard panels which are located on the engine room floor. One interesting feature of the electrical installation is that the higher voltage generator synchronizes with the system using the same synchroscope that the 2400 volt generators use. All oil circuit breaker controls, including the bus tie breakers, are electrically interlocked so that no breaker can be closed without operating the synchroscope.

Instruments and relays on the new installations were manufactured by the General Electric Company and are of a flush mounted design. Panels were wired and equipment installed by the plant force.

A Brown pyrometer, a duplicate of those previously installed, is mounted on station auxiliary switchboard located near the log desk for convenience. On this board is also mounted an Esterline-Angus curve drawing totalizing wattmeter which totalizes the output of the entire plant at both voltages, and a General Electric generator temperature indicator together with other necessary meters and gauges. Motoco thermometers indicate temperature of the cylinder head cooling water and the oil coming off the pistons. Alarms are provided for high jacket water temperature, low jacket water pressure and low lubricating oil pressure using Mercoid switches connected to existing general plant alarm systems. An interlock on the engine throttle sounds an alarm to prevent the engine from being started unless adequate oil pressure is available. Preparation of specifications, engineering and construction was handled by the Board of Public Works.

Schematic arrangement of electrical connections in the Grand Haven plant.



IT is safe to say few operators in the towing business have had as lengthy and varied experience with marine Diesels as Captain Thomas Ahlquist, managing operator of the Jamaica Bay Towing Line of Arverne, Long Island. In addition to his years of towing experience, Capt. Ahlquist was one of the few men in the field to grasp fully the significance of the initial trend from steam to Diesel. The recently rebuilt Diesel tug *Tompkins* gave us an excellent opportunity to talk over with him the experience of the Jamaica Bay Towing Line with marine Diesels.

A genial and interesting conversationalist, the Captain outlined his experience with marine Diesels dating back to his original purchase of a 60 hp. Fairbanks-Morse "CO" Engine in 1926. Since that time he has utilized a succession of marine Diesels of both the semi-Diesel and full Diesel types.

Captain Ahlquist cannot speak too favorably of the splendid service and economy he has secured from this equipment and among his numerous successful installations, one of the favorites was the venerable *Belle Harbor* with a 300 hp. F-M "CO". She turned in a yeoman's job until she was sold in 1933 to the Interstate Oil Transportation Company. After a

fire, she was rebuilt and sold by them to the Tremont Towing Line where her engine, now well over sixteen years old, continues to render outstanding service.

Among the vessels owned by the Jamaica Bay Towing Line, we might consider the late record of a trio, the *Minnie A*, the *Charles F. Bickel*, and the *Harvard*. They, as well as the most recent addition mentioned above, the *Tompkins*, furnish excellent clues to why Captain Ahlquist is so enthusiastic about marine Diesel propulsion.

The *Minnie A*, a wooden hull tug with a length of 48 ft., a breadth of 17 ft. and a depth of 6 ft. 2 in., was converted from steam to Fairbanks-Morse marine Diesel in 1930 and has an 180 hp. engine. In addition to being a real work horse, despite her small size, she emphasizes the economy of Diesel, for \$1.50 a day covers fuel and lube oil and she is really a two-man tug. In fact, on many occasions Captain Ahlquist has taken her out himself without a crew. Fairbanks-Morse pilot house control, by which complete maneuverability of the engine is in the hands of the helmsman, makes this possible. Incidentally, two of his tugs, the *Harvard* and the *Tompkins*, are the two largest towing vessels of direct drive, direct re-

SIXTEEN YEARS

EXP

y HEN

Three units of the Jamaica Bay Towing Line fleet which have been converted to Diesel.



EN
RS

DIESEL TOWING EXPERIENCE

by HENRY A. STEPHENS



The "Harvard," built in 1907, was converted in 1938 with the F-M main and auxiliary Diesels, seen left.

versible marine Diesel types with full pilot house control in New York Harbor.

Some fifteen months ago, the *Minnie A* underwent "modernization." This step was taken as recent advances in design have been rapid enough so as to make engines purchased at the time of the original installation on the *Minnie A* comparatively obsolete. Such manufacturer's improvements, however, as open head combustion and improved injection system, more effective scavenging with the backflow principle, needle roller piston pin bearings and constant speed governor, were incorporated in the existing engine on its original base at nominal cost.

This procedure of improvement led to greater reserve power, easier and quicker starting at low temperatures, constant engine generator speed independent of load change and reduction of the cost of operation. This latter fact was brought about through the curtailed use of fuel and lube oil, less maintenance and longer life of the wearing parts.

The second vessel, the *Charles F. Bickel* is powered with a 210 hp. Fairbanks-Morse Diesel. Originally built by F. A. Worden of Jersey City, N. J., the hull was replanked in 1921 in Norfolk, Virginia. Seven years later she

The F-M main Diesel on the tug "Bickel," looking aft.

was completely rebuilt by Jacobson & Peterson with a new superstructure, rail guards, stem posts, etc. Fifty-three feet long with a breadth of 15 ft. and a depth of 6 ft. 1 in., the *Charles F. Bickel* is built for the hard work tradition of the *Minnie A.* Her conversion from steam to Diesel was made at the time she was completely rebuilt by Jacobson & Peterson in 1928. The kind of a record she has built up can best be demonstrated by stating that, in over a decade, the Jamaica Bay Towing Line has only had to have one major repair—a burned out bearing that Captain Ahlquist frankly admits was caused by lack of maintenance.

The *Harvard*, originally purchased from the Great Lakes Towing Company of Cleveland, Ohio, in 1938, has likewise built up an outstanding record of efficient and economical towing service in Jamaica Bay. Originally built in 1907, she was brought in her old condition to the yards of the Jamaica Bay Towing Line, where a complete rebuilding job was done and her old steam machinery removed. Her thick plated hull is of unusually sturdy construction due to her former service as an ice breaker and when the new superstructure was put up, it was equipped with six steel plates for the deck and pilot house.

A Fairbanks-Morse 2-cycle, 300 hp. Diesel, operating at 300 rpm., furnishes the main power for this tug. There is also an F-M Diesel auxiliary, comprising a 10 hp. engine, driving an F-M rotary pump for before and after cooling, an F-M air compressor and a 2¾ kw., 36 volt, F-M generator, all clutch connected for operation separately, or combined, as the occasion requires. While the main engine is running, power for lights is furnished by a 1½ kw., 32 volt, F-M generator, driven off the flywheel, supplemented by an Exide Marine type battery for standby or peak load.

The latest addition, the *Tompkins*, was originally built in 1921 and converted at the beginning of this year to marine Diesel with a Fairbanks-Morse 400 hp. at 320 rpm., 12 in. bore x 15 in. stroke, 5-cylinder, direct drive, direct reversible engine. She is 60 ft., 9 in. long, 18 ft., 2 in. wide with a loaded draft of 7 ft., 9 in. As is the case on the *Harvard*, her main engine is fitted with a built-in air compressor, water pump, fuel oil pump, force feed lubricator, lube and oil filters and water cooled exhaust manifold as standard equipment.

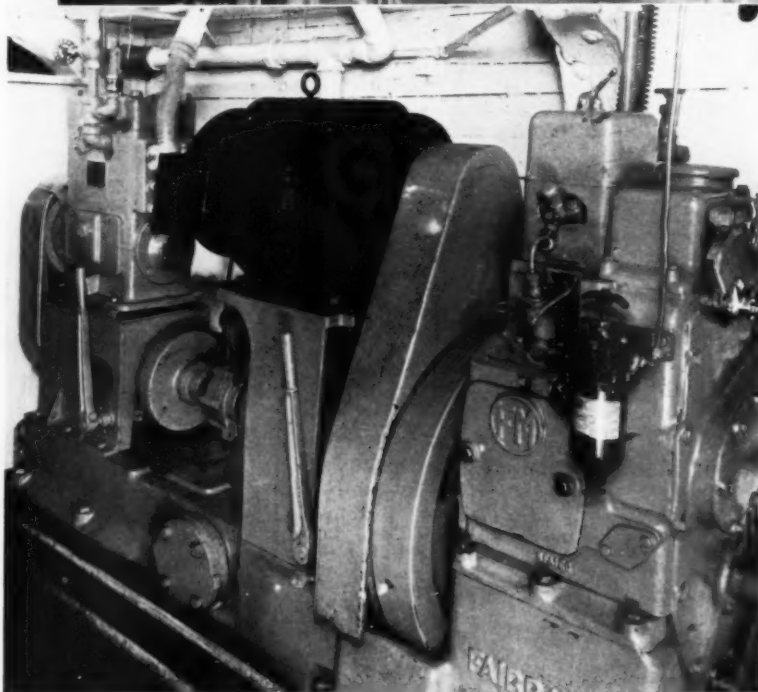
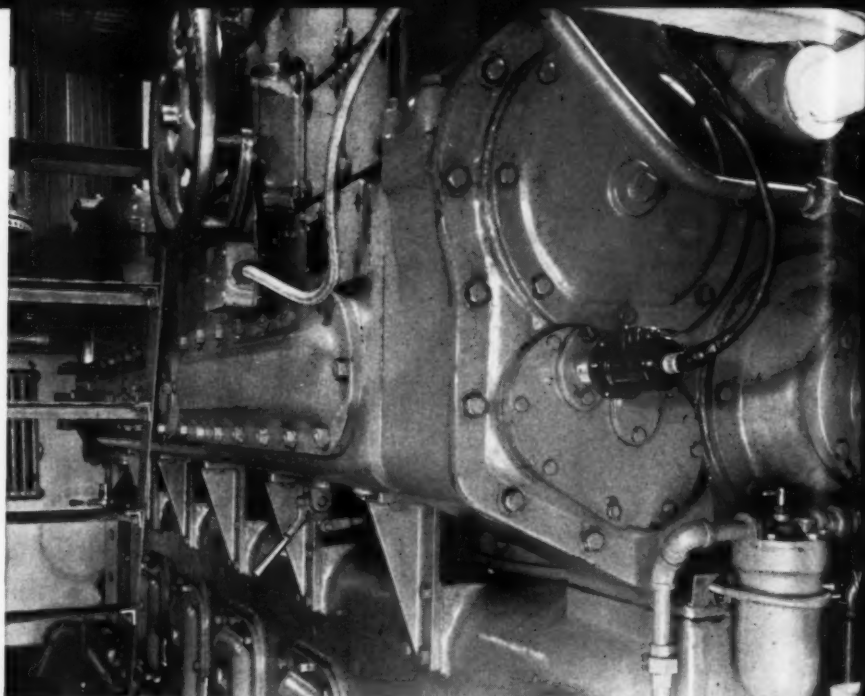
Captain Ahlquist utilizes a rather unusual type of drive with which he has had excellent suc-

cess. There is no flywheel pulley or tail shaft drive sheave, the generator being belt driven from the flywheel itself. The generator is mounted above the engine flywheel and an idler pulley is mounted on each side of the flywheel so that the belt drive is from the top central arc of the wheel.

Among the auxiliary equipment noted are Maxim intake and exhaust silencers, Alnor pyrometer and thermocouples, Fairbanks-Morse auxiliary motor-driven before and after oil and water pump units, fresh water cooling

furnished by Fairbanks-Morse rotary pump, and Schutte & Koerting heat exchangers; twin Briggs Clarifiers and the three 30 in. x 96 in. air tanks furnished by William B. Scaife & Sons. A Fairbanks-Morse 2¾ kw. direct current generator of variable speed is driven off the tail shaft. As on the *Harvard*, a bank of Exide marine type batteries is found.

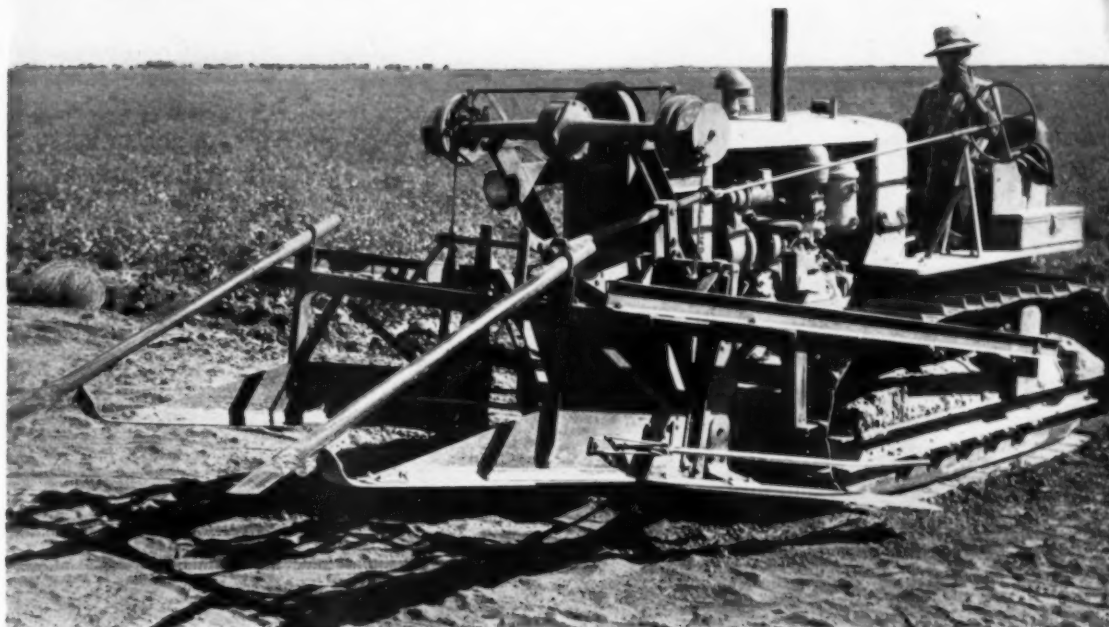
For over sixteen years, staunch marine Diesel engines have built up a record of continuous and outstanding service to complement the record of their owners.



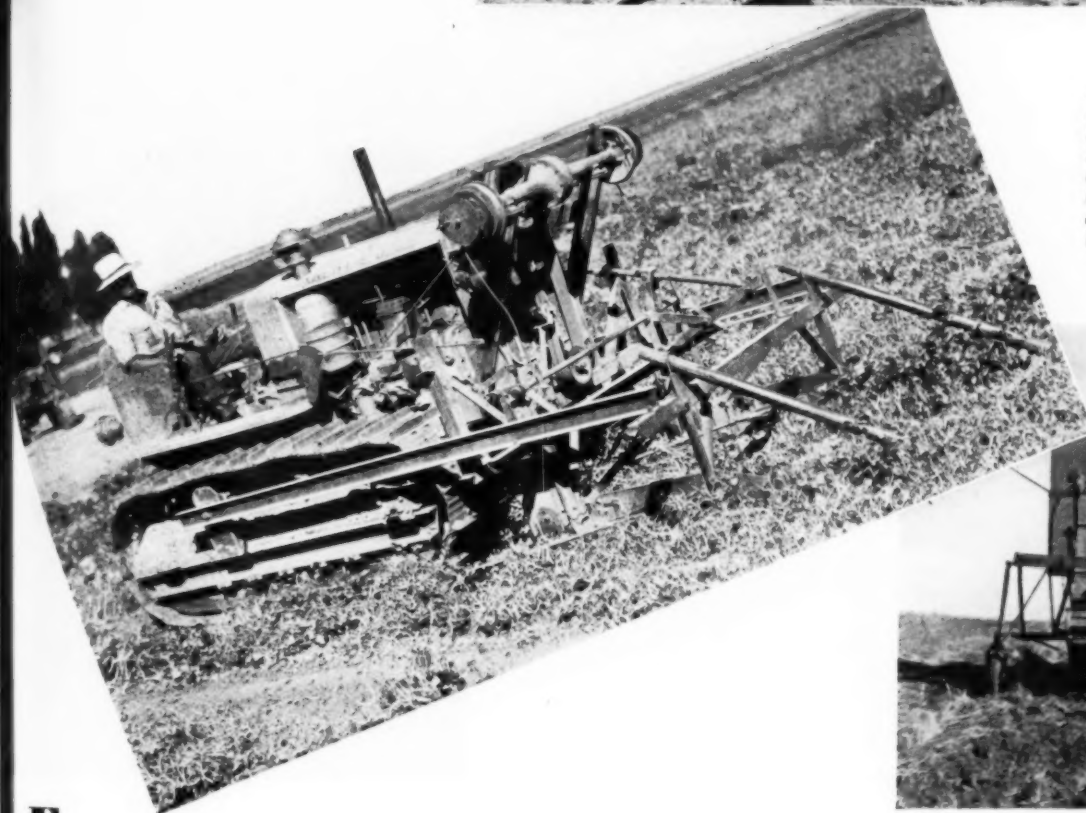
Top view: Main engine on the "Tompkins," a F-M 420 hp., 320 rpm. marine Diesel. Above: Fairbanks-Morse Diesel auxiliary unit on the tug "Tompkins." Note Pulolator fuel filter.

THE BEAN GOES TO WAR WITH DIESELS RIGHT BEHIND IT

By F. HAL HIGGINS



Above: Power lift cutter on a Caterpillar Diesel tractor as used in the West Side San Joaquin Valley bean area. Left: New-type all-steel sled bean cutter mounted on a Caterpillar Diesel tractor. Below: International Diesel tractor pulling a hay bean harvester in San Joaquin Valley, California.



EAST may be east and west west, but even the Army and Navy meets when it comes to putting the bean on its menu pretty regularly. Even though our officials brag that this time both Army and Navy are better fed than ever before, better than any other man's Army or Navy is or has been fed. But no one can get away from the bean in war, and the rationing is going to put it on a lot of plates it hasn't touched for decades due to its plebian status.

Generally the bean is a \$50,000,000 annual crop with Michigan and California fighting out the No. 1 state honors with Michigan usually a neck ahead. Idaho, Colorado and New York rank high right behind the two leaders, with

New Mexico, Wyoming, Nebraska following. There are an even dozen different varieties commercially important enough to be listed by the U. S. Crop Reporting Service: Large and Baby Lima, Small and Large White, Pink, Blackeye, Cranberry, California Red, Red Kidney, Pinto, Bayo and Garbanzo. The two Limas rank first in annual production, 1,355,000 bags of 100 pounds each being produced last year for the big flat kind, compared to 825,000 bags of the smaller type. The small white, or Navy, as we used to know it, produced 799,000 bags, with the Blackeye but a head behind it with 733,000 bags.

The Diesel tractor plays a big cost-cutting

part in the production of this nutritious crop. From the Mexican border to Canada, both on the coast and in the interior valleys, the big Diesel tractors since 1931 have been coming onto the job in both bean and small grain areas to cut the farming fundamentals in half, according to Farm Bureau and University officials who have kept track of costs. They cite the prices quoted for plowing, disking, harrowing, planting and harvesting to prove their contention that the arrival of the Diesel tractor made the biggest impression on farming costs in these areas in the history of agriculture—more than even the change from horses to gasoline tractors about the time of the first World War.

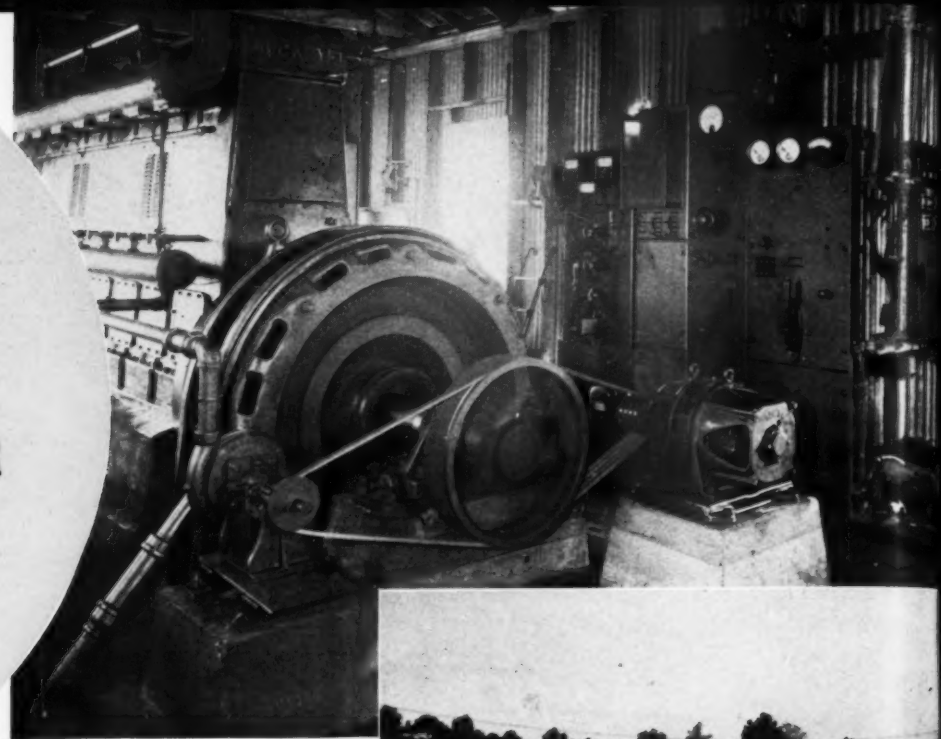
ONE GOOD DIESEL SELLS ANOTHER

By WARREN GLEASON

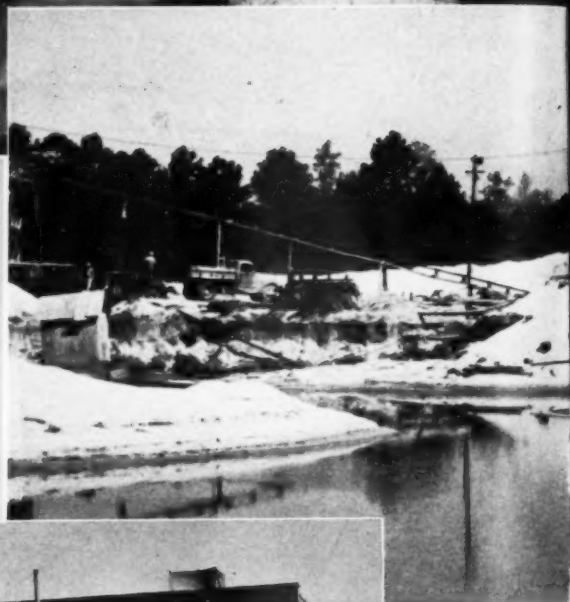
AS expressed by the erection engineer for one of the country's manufacturers of Diesel engines, "The industrial Diesel doesn't get the breaks when it comes to public acknowledgment or estimation of its worth. In the marine field, it's a different proposition. When a Diesel is installed in a tugboat or a trawler, it's always on the go, always in full sight of other engine users. The marine Diesel gets this break because its boat gets around and gives the engine a chance to get some publicity where it will do the most good; an industrial installation, however, doesn't have this opportunity. It's tucked away by itself, doing its job year after year, and in many cases it's never heard of."

This engineer's remarks are indeed true; and consequently this article is concerned with one of those industrial Diesels, lost in the shuffle of national production but of supreme importance to its owner. Also, it is one more case where the profitable operation of a Diesel for one owner sold another of the same make to another power-user in a different field.

About half a dozen years ago, Ed Kivett, operating the Kivett-Reel sand and gravel plant near the little community of Sun, Louisiana, was using a steam engine to turn the 2300 volt generator powering his dredge. Though oil was used for fuel, his electricity cost him about 3½¢ per kw., a cost which he had been unable to reduce very much in several years of operation. This high cost of current caused him to install a Diesel; he selected a Buckeye,



This Buckeye Diesel supplies power for the extensive sand and gravel operation of the Kivett-Reel Corp., Sun, Louisiana.



J. P. Earle, owner of this ice plant at Bogalusa, La., heard about the Buckeye Diesel at Kivett-Reel Corp., and bought one for his plant.

of 7 cylinders 9½" by 14" developing 262 hp. at 400 rpm., corresponding closely to his steam plant which was of 250 hp.

Three years of operation of this engine gave Mr. Kivett a new set of operating costs; his electricity under the new arrangement cost him not over 9/10 of a cent per kw. And as to repairs and wear, he dismantled his Diesel after three years of 9 hour a day operation and inspection showed that it was impossible to remove a 3/1000 in. shim from the main bearings; after two more years of consistent operation, Ed Kivett still reports no bearing nor

crankshaft trouble and low cost electricity. It's too bad that an engine giving this kind of performance isn't on wheels or in a boat so that the world can watch it work. However, the news did get as far as Bogalusa, Louisiana, about ten miles away.

Here, a man by the name of J. P. Earle was in the ice business, shipping his ice in from New Orleans and using power company current to operate an ice machine for his cold storage room. He saw bigger business opportunities if he should install his own ice manufacturing plant. Consultation with Mr. Kivett



Closeup of the graders, also electrically driven from the Buckeye Diesel generating unit.

General view of the Kivett-Reel sand and gravel dredging and grading operations, all powered by Diesel generated current.

brought about the installing of another Buckeye Diesel in the Earle plant.

This is no big plant as ice-plants go. The engine is of 2 cylinders, 9½" by 14", developing 75 hp. at 400 rpm.; for use in its present job, the engine is turned at 360 rpm. and produces about 67½ hp.

American Bosch injection is built-in, as is the Purolator fuel filter. The Buckeye patented Silent Watchman gives automatic protection against cooling or lube failure; an Alnor pyrometer is mounted on the engine's operating end for the operator's guidance, but according to plant engineer Sam Taylor, about all he has to do is to start and stop the Diesel. Ever since he's handled the engine, says Mr. Taylor, he's never had a particle of trouble with it and has never had occasion to send for a Buckeye service man. He changes

his lube oil every 30 days, using Marine Vital SAE 30. The Buckeye Diesel has now been powering this plant for four years; just one of those installations which never get much publicity, but which go on doing the work, year after year, always reliable and requiring no repairs and mighty little other attention.

The plant has a capacity of ten tons of ice daily and during the summer month it is always called upon for excess production. Year in and year out, operation varies from two or three hours daily to all day operation.

The engine is direct-connected to a 2-cylinder York compressor; the tail-shaft is carried in a Shafer bearing and a flexible coupling is used; also driven is a 75 kw. New Orleans Electric Engineering generator, supplying sufficient electric current for all the plant's requirements.

Engine cooling is by city water, direct to the engine with the aid of a Fairbanks, Morse & Co. centrifugal pump, V-belt driven from the tail-shaft. Starting is by air, using an electrically-driven Curtis compressor, wired so that it can be driven by the plant's generator for maintaining pressure or by city electricity for emergency starting.

Engineering of the plant was handled by Norman Maxwell, of New Orleans Electric Engineering, along with practical suggestions by Ed Kivett. The cooling of the ammonia compressor head is a neat piece of work. The roof of the engine room is a tank. A 2" Myers electrically-driven pump keeps the tank full of water; from here it flows by gravity, cooling the condenser outside the building and the compressor in the engine room. Other electrical use is for the Westinghouse motor driving the agitator; for the G-E motor driving the Baker ice machine; for the 1½ hp. motor turning the Hoffman centrifugal blower and for the Fairbanks-Morse motor powering the ice core-pulling mechanism.

The story of this plant, a small one in a small city, is not in itself of great importance; however, this Diesel is typical of many such installations throughout the country, where small industrial plants of various types are economically powered by Diesels of such reliability that their owners have almost forgotten them, overlooking the fact that here is real news, a forecast of industrial power development in the post-war period.

LAFAYETTE, Louisiana, is a fine little city in the rich and fertile Sugar Bowl section. Almost everything in Lafayette appears clean, new, and prosperous looking, which is because most things in Lafayette are new. Though the community was founded long ago, its real growth has been recent; fifteen years ago Lafayette's population was only about 5,000. Now it's over 15,000.

One of the factors involved in this rapid expansion has been the progressive attitude of the city officials who have taken advantage of all possible opportunities to induce new business to locate there, and who have made the best of the oil, agricultural, and other developments in that section. The development of an adequate power system, municipally owned, has kept pace with the city's needs, because the men in charge have had the welfare of the community at heart.

Wilson J. Peck, Commissioner of Public Property, is now serving in his twenty-fourth year in that office; the position is an elective one but his re-election has been consistent. And J. Frank Ard, superintendent of the Department of Public Property, including the city water and light plant, is also in the twenty-fourth year in his job. The superintendent is not elected but is appointed by the Commissioner. These men know their jobs.

Lafayette's first municipal power plant was put into operation about forty-five years ago and consisted of two steam engine generating units of 300 hp. combined capacity. The plant was located on the same corner lot which now is occupied by a power plant of far different composition and capacity.

The original steam outfit gave fine service for over twenty-five years but, in 1925, the signs of municipal growth were too plain to be mistaken and a modern generating system was seen to be a necessity. Diesels were decided upon and a pair of 600 hp. engines were installed. Another 600 hp. engine was purchased in 1927, giving the plant a generating capacity of 200,000 kw. per month.

Along about 1929, the town really began to boom; twenty-four-hour-a-day work was necessary on various construction jobs and the rapidly increasing number of residences and business buildings demanded more current. Accordingly, 1930 saw the purchase of a fourth 600 hp. engine of the same make as the original pair. These first four Diesels were all of the four cycle type, were dependable producers, and might have been in operation today except

that the town persisted in growing, even through the era of depression.

In 1936, according to Engineer Henry Martin, Mr. Peck and Mr. Ard saw plainly that a further increase in plant capacity was an absolute necessity and decided that there was no point in cluttering up the plant with any more 600 hp. engines. A Diesel of double that power and generator to match were indicated, so the Commissioner's office investigated the field.

The engine selected was a Fairbanks-Morse Diesel, of 7 cylinders, developing 1,225 hp. at 300 rpm., direct connected to a Fairbanks-Morse generator of 856 kw., 2,400 v. at 300 rpm., 1,070 kva. Of two-cycle type, cooled by direct circulation of city water, equipped with Nugent pressure filter for fuel and a centrifugal reclaimer for lube oil, Alnor pyrometer, F-M automatic alarm, and Marshalltown gauges for water, scavenging air, starting air and lube oil, this engine has only recently had its second overhauling job in six years of daily operation with new rings being the only repair parts used.

Plant performance with this unit caused the installation in 1937 of a second big seven-cylinder engine, duplicating the first Fairbanks-Morse installation. Records show that in the twelve month period from June 1, 1936, to May 31, 1937, the plant which now included the two 1,225 hp. Diesels provided 183,600 kw. hours for street lighting, 996,000 kw. hours for water pumping, served 2,600 domestic power consumers, and 640 commercial or industrial users, including a couple of cotton gins and an oil mill. Net operating profit for the period was \$68,699.70. Good business!

Which called for still another engine. In 1939, a F-M Diesel of 1,400 hp. at 300 rpm., with a 1,000 kw. generator was added. And, in 1942, the city again increased its electricity production with a second 1,400 hp. Fairbanks-Morse Diesel, fitted with a similar generator.

These 1,400 hp. engines are of eight cylinders, 16 in. by 20 in., 2 cycle, pump scavenger type. The first three F-M engines are cooled by city water, taken from the main at 78 degrees; the latest addition uses a Ross heat exchanger. More uniformity in temperature control is possible and heat exchangers may be installed on the three older engines.

A Honan-Crane continuous refiner is installed for lube filtering. This refiner takes care of the new engine only, but plant engineers state that it could easily handle an additional engine



with its capacity for 96 gallons per hour. A Nugent filter is used in the fuel oil line.

The exhaust is silenced by a Burgess snubber; intake air passes through a filter-box, above which is fitted another Burgess snubber. Alnor pyrometer, Madison-Kipp lubricator, Woodward governor and the F-M gauges equip this latest engine as well as the older F-M Diesels.

On all the Fairbanks-Morse Diesels in the plant, an electrically driven oil pump automatically takes over when the engine is stopped and its built-in oil pump ceases operating, to ensure gradual cooling of the mechanism. Schutte & Koerting coolers are installed throughout for lube oil cooling.

In 1927, Lafayette's plant was generating 200,000 kw. per month; in 1942, the monthly output is 1,100,000 kw. Users now include the South West Louisiana Institute, a teacher's college; several ice factories; a cotton oil mill; lumber yards; a sash and door factory and two large and modern hotels. Total horsepower is 4,250 in the four F-M engines, plus two of the old Diesels of 600 hp. each now used for standby service.

Besides paying customers, the city power plant supplies electricity for public purposes to the value of \$63,000 annually for the fire department, all public schools, street lighting, churches, municipal buildings, water filtration plant, sewage disposal plant, and a municipal swimming plant.

And best of all, these Diesels are paying for themselves strictly out of excess plant revenue, as no bonds were issued to cover their purchase.



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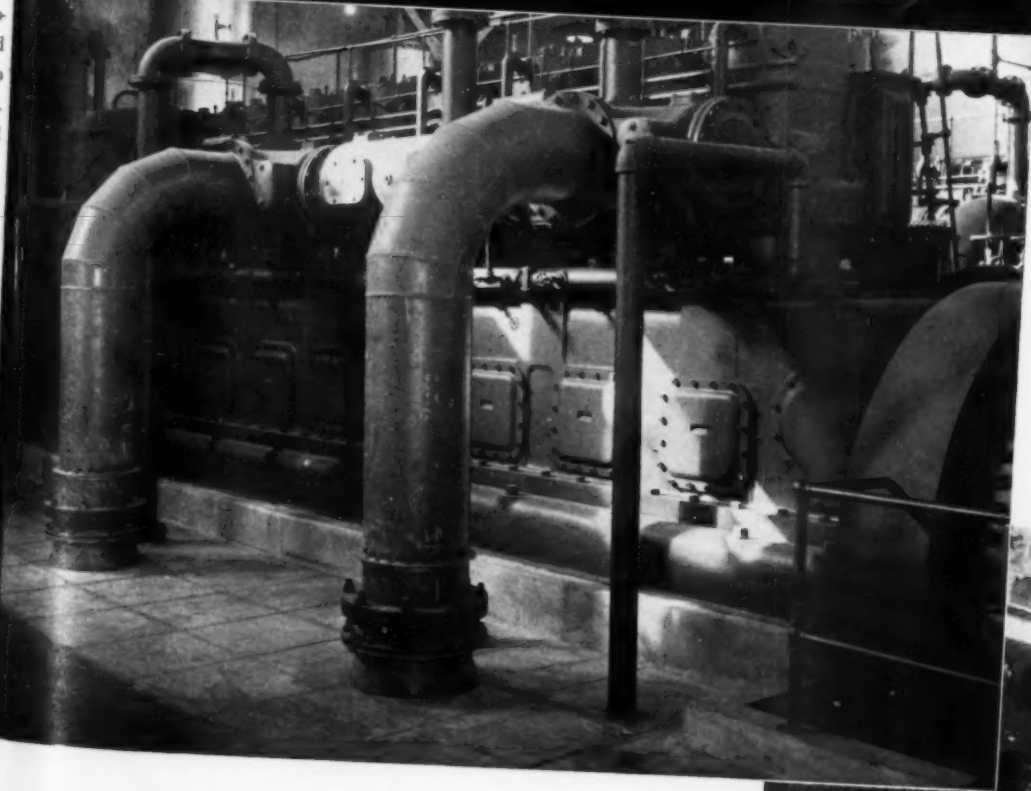
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DIESELS PAY THEIR WAY

By HENRY J. BARBOUR



Top left: General view of the Lafayette, Louisiana, power plant. The two engine views show control side and exhaust side of one of the two 1,400 hp. Fairbanks-Morse Diesels in the Lafayette plant. Right: View of the switchboard which handles the current from this 4,250 hp. plant.

NEW HAVEN RAILROAD DIESELIZES

ITS NEW HAVEN-BOSTON

SHORE LINE

By CHARLES F. A. MANN

FORMING a great connecting link between New England and the Middle Atlantic area, one of the greatest industrial areas in the world, as well as most populous, the New Haven Railroad is literally a vast interurban railroad with frequent service every so many minutes throughout the 24 hours of every day.

Traffic from New York and all points West and South feed in at one end and traffic from Boston, North and Northeast, feed it at the other. No indifferent railroading attitude or Prima Donna business will work on the New Haven, for practically half of its total daily service connects with some other railroad on close timing, at either or both ends. The tendency has been to synchronize the entire Mainline, or Shore Line operations so that there is relatively little difference between the speed of its passenger and freight trains. The world-dream of a "One Speed Railroad," for freight, passengers, express and mail, and the banishment of the old-fashioned "Drag" freight that crept along at 15 miles per hour, comes nearer to fulfillment on the New Haven than on any other railroad. They travel fast, on the New Haven, to get out of each other's way. If they didn't a backup of trains would result. Electrified in its densely operated New York

Zone, as far out as New Haven, Connecticut, the great operating problem has always been its steam-operated 157 mile gap between New Haven and Boston, where frequently spaced villages and cities, numerous drawbridges and long curves, hill & dale type of profile, and dense local and through traffic causes more headaches.

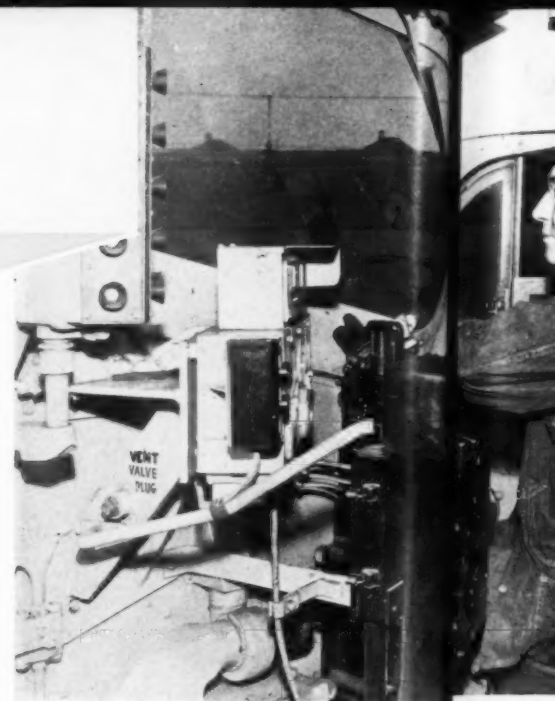
Steam operation has, in almost every traffic boom since 1900, given rise to plans to extend electrification clear through to Boston, on the New Haven's Shoreline, but the terrific costs involved, the constant inroads of water borne freight which cut deeply in periods of depression into the New Haven's freight earnings, and the uncertainties of the passenger situation in the 1920's always forestalled electrification beyond the Commuting Zone out of the New York Terminal area. It was cheaper to burn coal out where fresh air and farms line the rails, between the crowded cities.

The New Haven has, even in the depression, maintained its lead as America's greatest passenger carrier, total revenue to passenger revenue compared. Not even airlines can cut much more than 90 minutes off the New York Boston run, due to airfields and connecting transportation, now gives promise of building

up passenger traffic by faster operation, particularly in the Post-War period.

Taking the middle road of Standardization, high daily operating practice, and adapting a type of Diesel locomotive suitable for either freight or passenger, of either 2,000 or 4,000 horsepower, the New Haven purchased 7 new Diesel units in 1942, plus one they already were testing, from American Locomotive Company, and set them to work on a clock-like piece of tough railroad precision-operation such as has never been tried before, shuttling back and forth between New Haven and Boston, on a continuous daily average mileage per 2,000 hp. unit, of 450 miles, and discounting the systematic 12 hour layover for routing servicing, after each operating cycle of 1,000 miles, actually they run nearly 650 miles per day.

This kind of operation eliminates the last howl of the Old School Ties of steam power, that Diesel investment is too high per horsepower, for this is equalized by using the Diesel enough added daily miles to offset this disadvantage as compared with steam power, and sometimes shove it clear into the background of a lot of



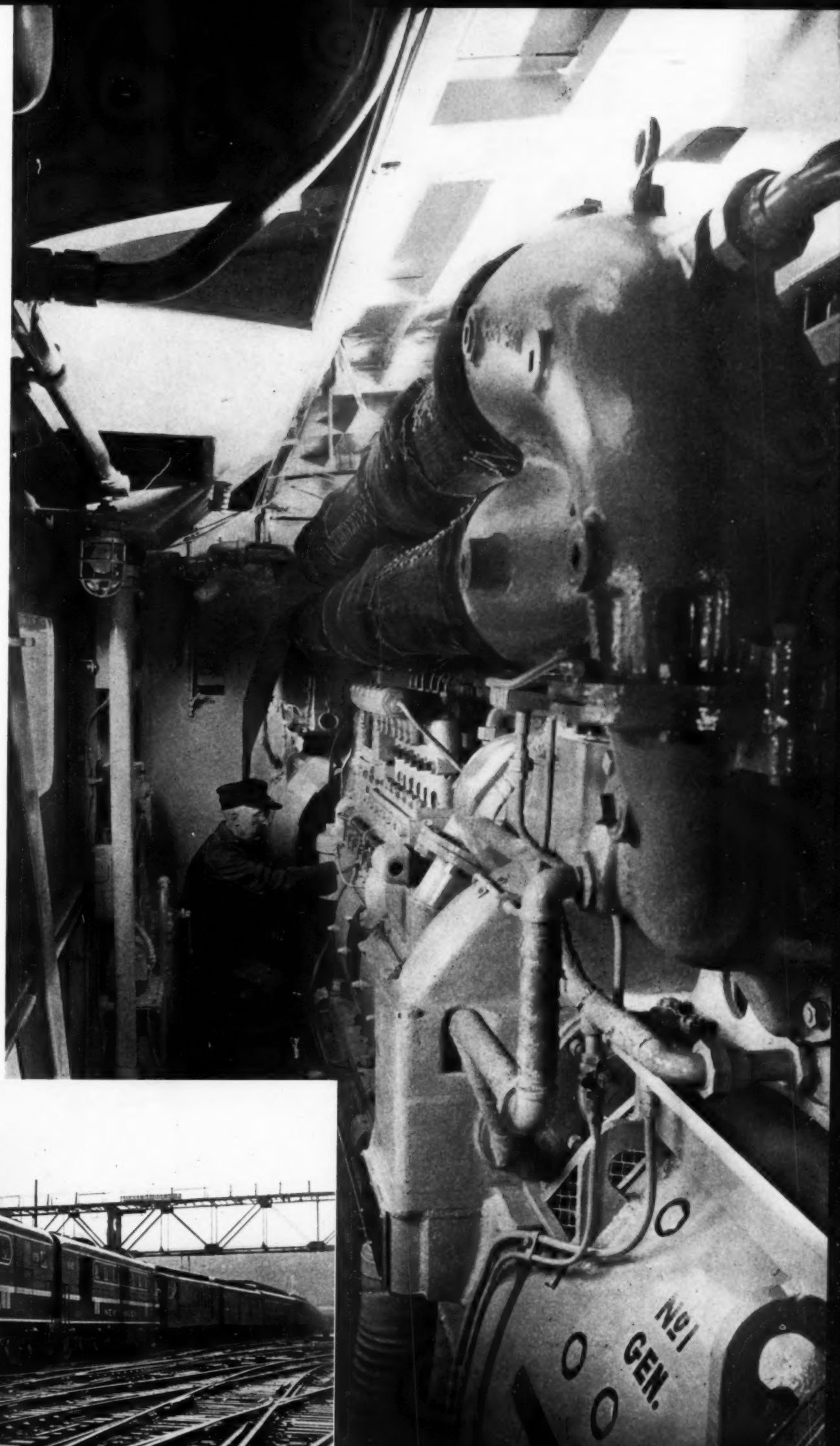


Engineer Alton D. McLeod
at the controls of New Haven
Railroad's new Alco-built
diesel-electric locomotive.

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Installed in each locomotive
unit are two Alco, 1000 hp.
supercharged, Buchi system,
diesels—one shown here.

New Haven two-unit Diesel-
electric locomotive pulling a
heavy passenger train into
Boston.





Above and right: Head-on and quartering-side views of the new Alco-GE, 4000 hp., Diesel-electric locomotives.



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slowdowns,
train signal

red ink for steam power.

By ingeniously working them into the freight-passenger pool of motive power, the New Haven now operates 25 trips per day between New Haven and Boston with 8 Diesel units and a full 8-10 hour shop layover schedule for at least two units per day, thus keeping the Boston Diesel repair facilities at full capacity every day of the week. Some trains require only one unit, and others because of their great weight and speed, require two units, and there are always two units at either end of the run to select power for the next train out.

Schedules were not revised for Diesel, but the absolute tightness and rhythm of this densely operated line demands that no breakdowns occur.

This amazing setup is the current "Greatest" world test for Diesel locomotives, and regarded by many as a harbinger of many more mainline Diesel locomotives for post-war construction. Developments will be worth watching.

If the reader will recall, it was just two short years ago that Railway Managers were nodding approval to Diesel operation within and all by itself, in any railroad operation, but never in a tight pool with steam power. Okay for prima donna stuff, but for the daily grind, NO.

The American Locomotive Company, long builders of power for New Haven, undertook this spectacular Diesel job for the New Haven, boldly, and without prejudice, even though it ruined their plans to electrify more New Haven mileage. It designed an improved version of its 2-engined, standard 2,000 hp. unit, geared to operate at 80 miles top speed, yank either a 4,500 ton freight train at 50 miles per hour or a 16 car, 1270 ton passenger train at 75 miles per hour with fast acceleration on the innumerable drawbridge, curve and station-stop slowdowns. A large Clarkson heating boiler, train signal system, high speed braking and

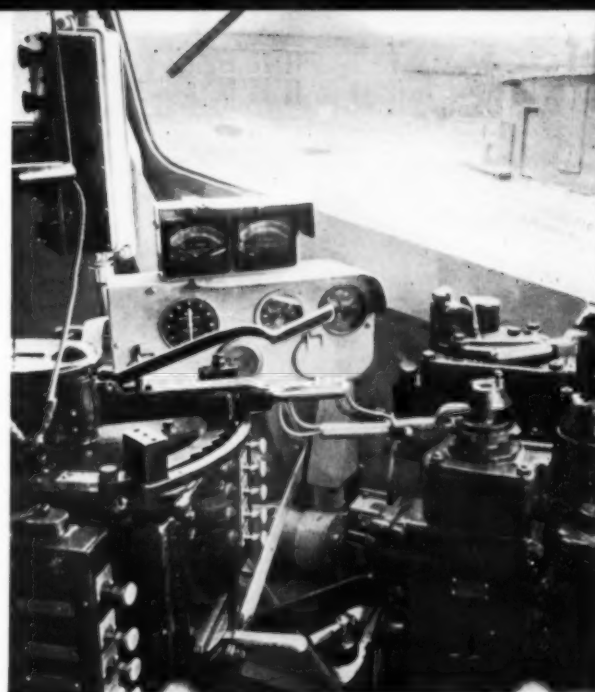
train control was fitted to make them suitable for freight or passenger running without batting an eye or adjusting one gadget. Double-unit operation eliminates need of station turn-arounds, too. And mostly the units operate in back to back pairs on the heaviest, tightest schedules on the line. Ten of the famed crack New Haven snooty passenger trains and fifteen of the highball fancy freight trains, with few flat wheels, are yanked smoothly and swiftly by the Diesels in the engine pool. The seven new ALCO-GE units, and the original unit, have the following principal characteristics:

Traction effort, continuous	50,400 lbs.
Traction effort, starting max.	139,000 lbs.
Maximum speed	80 miles per hr.
Traction effort at 20 MPH.	31,000 lbs.
20 MPH.	21,400 lbs.
50 MPH.	12,900 lbs.
80 MPH.	6,500 lbs.
Wheel diameter	40 inches
Truck wheel base (6 wheel)	15 ft. 4 in.
Length overall, per unit	74 ft.
Two units	148½ ft.
Maximum curve	21 degrees
Width overall	10½ ft.
Height overall	14 ft.
Fuel capacity, per unit	2400 gallons
Water capacity, per unit	2050 gallons
Sand capacity	32 cubic ft.
Weight on driving axles	231,000 lbs.
Weight on idler axles (center)	115,500 lbs.
Total gross weight per unit	346,500 lbs.
Diesel units consist of two 1000 hp. 12½ in. x 13 in. Alco 4 cycle, 6 cylinder, Supercharged, Buchi System, 740 RPM. engines, each direct connected to a GE generator. Each unit driving two-gear traction motors, with 64/19 gear ratio, on truck directly underneath its own Diesel generating set.	

The Diesels have a welded steel base, built in two stage Westinghouse air compressor, with capacity of 144 cfm displacement and a Buchi turbo-charging blower driven by exhaust gases.

Each Diesel also has a Sturtevant traction motor cooling blower, besides a G.E. Aphonic radiator blower fan, belt driven, the main Generator and a belt driven exciter and an auxiliary 64 volt generator for charging the 32 cell Exide starting and lighting battery. A Clarkson 2,250 lb. steam heating boiler is fitted in each unit also, beside the air reservoirs of 62,000 cubic inch capacity and the heavy streamlined nose below the operating cab contains the air brake and train control equipment and inside-mounted headlight.

The operators cab are the conventional deluxe type, with shatterproof type glass windshields, no draft ventilation, foot warmers, defrosters, soundproof walls and soft seats for the crew, with all the automatic signal and warning devices now almost standardized practice on all Diesel locomotives.



Closeup of Control Station

The entire locomotive cab is built on a truss bridge system, with plymetal and plywood panelling. Running gear is a product of General Steel Castings Corporation, with Timken roller bearing main journals and highly accessible traction motors.

The locomotives are carefully and thoughtfully designed to withstand cold New England winters, and hot Summers, and to serve continuously as either passenger or freight locomotives with minimum servicing and unlimited life. The rugged, heavy ALCO Diesel is compact and foolproof as can be made, with exceptionally large space around all sides of the engines.

A typical operating routine of Cab A, for example, calls for starting from Boston at 8 A.M. on a fast passenger, making a round trip to New Haven and returning on a Passenger train at 3.55 P.M., covering a distance of 314 miles, with a little over one hour layover in New Haven. An hour and a half later a round trip on a fast freight is begun, arriving back in Boston on another fast freight at 3:50 A.M., ready to start all over again next morning at 8 A.M. In the case of a typical 2-unit operation, the cycle reaches 10 round trips, five on freight and five on passenger trains, before a layover of 11 hours for servicing in Boston is made, and covering over 1600 miles in about 600 hours!

The New Haven at present has, besides its fleet of twenty mainline Diesels, forty-two 600 horsepower American Locomotive Co. switchers, and seventeen General Electric switchers, with no more steam switchers being built.



UNCLE SAM'S NEW WEAPON

in the battle of the Atlantic

DOWN THE WAYS have come the first of hundreds of the Navy's new DE boats.

These Destroyer Escorts will search out preying Nazi subs and give them the fight of their lives. They're Uncle Sam's weapon aimed to break the back of the submarine menace—to win the battle of the Atlantic.

These sleek ships are swift, sturdy and powerful—ready for long days of anything the Atlantic has to offer.

They bristle with the steely authority of a destroyer—worthy armament for a gallant crew to wield with deadly accuracy.

Already the first of these ships are seeing service. In them you'll find powerful General Motors Diesels. And an important percentage of their sister ships to follow will also have GM dependable long-range power.

Thus in today's vital assignments, these engines are displaying the stamina, reliability and quick response that owners of GM Diesel-equipped commercial boats know so well.

OFFICIAL U. S. NAVY PHOTOGRAPH



GINES
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Knox Reveals Deadly New Escort Ships Set to Battle Axis U-Boats

WASHINGTON, March 5

Speedy and deadly,

new type warcraft is flying the American flag ready to battle undersea raiders, Secretary of the Navy Knox disclosed today. "Several score" of the sleek little craft already "are in the water," he said, and "several hundred" more are called for in the construction program.

Known as a "DE" or destroyer escort, the new craft is somewhat of a cross between the famed British corvette and the larger but more expensive and the larger but more powerful destroyer. "It is more powerful and effective than the corvette," the navy said, "but lacks some of the destroyer's power, speed and armament which are not essential to convoy duty. It is a specialized craft with a definite job to do."

That job will be convoying cargo vessels through submarine-infested waters, a task now performed by the bigger destroyers which then will be released for combat duty.

Called Small Destroyer

The new anti-sub weapon he described as "really a small de-

stroyer." The navy said it has a displacement of 1,300 tons, a waterline length of about 300 feet and a beam of from 35 to 36 feet. That is approximately the size of destroyers of the first world war. The armament was not disclosed but the navy said it includes "guns heavy enough to enable her to shoot it out with submarines on the surface, anti-aircraft guns of various calibre, depth charges for anti-submarine work, and torpedo tubes to deal with the threat of surface raiders."

The new craft costs approximately \$3,500,000 or about half the cost of a destroyer. It can be built on a mass production basis in approximately four months as compared with the average of nine months required for a destroyer. "And we are working up to quantity production," said Rear Admiral Edward L. Cochrane.



GINES . 150 to 2000 H. P. CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

GINES 15 to 250 H. P. DETROIT DIESEL ENGINE DIVISION, Detroit, Mich.

COMOTIVES ELECTRO-MOTIVE DIVISION, La Grange, Ill.



DIESELS MIX WELL IN SALAD BOWL

By F. HAL HIGGINS

THE Salinas Valley is usually rated the "Salad Bowl of the Nation" by people outside that area as well as by local boosters. True it was "cow country" since the days of the Dons and was so recognized more than a century ago by a Dana book that described the traffic in cattle hides via round-the-Horn sailing vessels.

But in the past fifteen years, with the rise of the svelt figure and the decline of the male waistline, lettuce as the chief salad roughage has put this fog-kissed valley on the map as the main source of this crop. True, lettuce is rotated with sugar beets, carrots, celery and other vegetable crops that are turned out in volume and quality by big operators who keep one eye on New York and lesser metropolitan marts while applying fertilizer, machines and brains to the task of getting five crops in two years. In a nutshell, these farmers know their vegetables all the way from the ground to the metropolitan mouth.

So, we start with a farmer who is so good at whipping his problems and keeping out of trouble that he is the despair of politicians who are looking for the kind of farmers who have to ask the Government for loans, extensions of loans, subsidies, and all the other kinds of vote-

getting bait built up through the years as the marginal and submarginal farmer yelled for help. These commercial vegetable growers frequently have their own outlets in Chicago, Los Angeles and New York and ship their vegetables by the iced carload just fast enough to keep the market from breaking. They work on what Cat Dealer Ben Hulse at El Centro in the Imperial Valley calls "programmed farming," which means laying out a program to plant and harvest all through the year to supply the demand just fast enough to insure a profitable price all the time. One ardent New Deal critic who wanted to reform the state of California with a book and a series of lectures a few years ago told an audience of school teachers that he had watched these vegetable growers operate and they were not farmers. He cited one who had studied the Boston market and its prices for carrots over several years marketing until he figured he could make a lot of money by producing a crop of carrots that would hit Boston a certain week in March. And this grower so accurately plowed, fertilized, planted and irrigated that he hit the mark he aimed at and cleaned up \$20,000 on his crop!

So, we come to the ingenious cost-cutting farm

equipment that these lettuce growers design, build and use. Back about 1935 and 1936, labor troubles and "hot lettuce" developed in the Salinas Valley. A lot of lettuce was spilled on the highway, more was left in the field, but the strike was broken. However, the growers never hesitated to pay the top price for both field and shed labor. They merely wanted to run their own farming operations and hire their own help. Ever since, however, with the rise in labor costs, more and more machines have appeared. Finally, the lettuce beds were straddled by a wide truck with all-wheel drive.

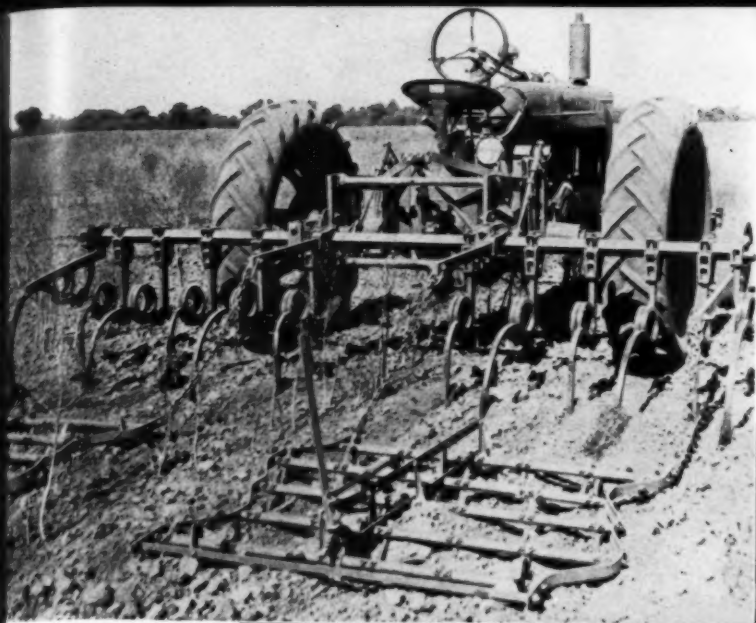
That's where the Diesel came into the picture as the power in these rebuilt Ford cab-over-engine trucks. The local Ford dealers' shops handled these jobs as wanted by the lettuce growers, the Ford trucks becoming powerful \$3300 jobs that cut about 40% of the stoop labor out of the fields and paid their way immediately.

Before these wide tread trucks appeared, lettuce cutters filled baskets and carried them over several rows to a road that ran along the edge of the field, these roads having to be left every 30 rows or so for quite a loss in growing area in each field. Now, no field roads are needed, and the dual wheels on the rear get the loads of lettuce through wet fields, over loose rough irrigation ditches and laterals that are plowed down to level at harvest time. These Hercules engines in the Ford trucks handle the low-gear driving through the fields easily as the stoop labor loads the big baskets on rollers in the truck body. This pace is all low gear with frequent stops while loading with a drive out to the highway when loaded and a fast 35-mile-an-hour dash to the packing shed and back.

The Diesel solved the problem, saving enough in fuel costs and time to pay for their higher cost. They kept lettuce production up in spite of rising labor costs. Now, under 1943 war demands of Uncle Sam, lettuce production will be cut heavily and carrots, cabbage and sugar beets stepped up. But these men and their machines can handle them all without batting an eyelash. They already hold all the world's records on sugar beet production for tons per acre, sugar content per acre, and efficiency of production. The Diesel is right at home with them on such a war job. The valley is full of Caterpillar, International, Allis-Chalmers and Cletrac Diesel tractors that prepare the seed-bed, make the irrigation ditches and cultivate. Incidentally, notice the rough going the Diesel truck shown above is in—just an irrigation ditch leveled off leaving soft clods.

DIESEL WHEEL TRACTORS CUT ASPARAGUS COSTS

By F. HAL HIGGINS



West coast International dealer flew to Chicago to place the order. President McAllister of International Harvester Company and this high-wheel Farmall was the result.

After learning Diesel's economy in track-type tractors for plowing, harrowing and reclamation, farmers asked for wheel-type tractor for jobs as this—and others.

"GRASS", as the trade calls the bushy-headed crop known as asparagus, got a big lift in California's delta area of the Sacramento and San Joaquin rivers two years ago. It came about when International Harvester Company's veteran Rio Vista dealer hopped a plane for Chicago and went in to tell the president of that biggest farm machinery manufacturer in the world that he wanted his Diesels on wheels for the asparagus growers. Much to the surprise of everybody but George Gordon, dealer, and President McAllister of International, he sold the idea and got the famous International TD40 lifted from its track chassis to International's cane-type wheel tractor for the most economical power that has come into the asparagus fields to date. It was a lightning-change act, too, for President McAllister called in his Chief Engineer right in the midst of

the Dealer-President conversation and asked how soon this job could be done and shipped to California. It became a fact inside of a couple of weeks instead of taking a year or so of red tape, trials, changes and OKs by various engineers and officials.

So, today, in spite of war orders from Government that stopped the Diesel's farm progress dead in its tracks more than a year ago, those 1941 International wheel Diesels are doing a great job for their farmer owners on asparagus and other crops like tomatoes, sugar beets and corn. The latter crop may not sound like a California one to those who don't know the San Joaquin delta where a lot of it is grown for live stock and poultry feed. Also, the husks from this long flinty ear of corn is harvested by specially trained laborers for tamale wrappers.

The asparagus crop last year totaled 68,204 acres that filled 2,258,046 cases of asparagus. That's just what went into cans with a lot more consumed as a fresh vegetable.

The success of the International Diesel on wheels brought out a second such piece of cost-cutting power consisting of a Buda-Lanova Diesel engine in an "Oliver 80" row crop tractor. Only about three of these arrived year before last when the company was stopped by war's demands on Diesel engine builders. However, they left their mark and whetted a latent sales appetite for more "when the lights go on again." These two wheel tractors powered by Diesels forecast a West Coast farm-demand that will change over from gasoline to Diesel most wheeled tractors of that size, your Old Reporter believes.

DIESEL ENGINES IN NAVAL SERVICE THEME OF 16th NATIONAL OIL AND GAS POWER CONFERENCE

THE second wartime National Conference of the Oil and Gas Power Division, ASME, will focus attention on the use of Diesel engines in naval service, in a program featured by an address by Rear Admiral Earl Mills, Asst. Chief, Bureau of Ships, an inspection trip to the world-famous U. S. Naval Experiment Station, and a technical session devoted to maintenance of naval Diesel engines. The meeting will be held June 14-16, with headquarters at the Lord Baltimore Hotel, Baltimore, Md.

in naval service will feature a paper presented by the Engine Division, Bureau of Ships, to be followed by prepared discussions from representatives of the various engine builders. This session will be held Monday afternoon, June 14. At the banquet that evening, Admiral Mills will be the principal speaker.

The inspection trip to the U. S. Naval Experiment Station will be limited to 150 and proper credentials, including proof of citizenship, must

laboratory, and recently completed chrome-plating plant. This trip also will be limited to those presenting proper credentials.

At the Exhibit held in connection with the Conference, more than 20 leading manufacturers of engines and accessories will display the latest in equipment, design and research developments.

The Ladies Program Committee, under the

16th NATIONAL OIL AND GAS POWER CONFERENCE

Tentative Program

Monday, June 14

Registration10:00 AM
Get-Together Luncheon12:00 Noon
Welcome by Prof. A. G. Christie, past-president, ASME, and Honorary Conference Chairman, and by Major E. B. Whitman, president, ASCE, and Honorary Conference Vice-Chairman

Session on Naval Diesel Maintenance2:00 PM
"Maintenance of Diesel Engines in Naval Service"—Paper presented by Engine Division, Bureau of Ships, Navy Dept. To be followed by prepared discussions from representatives of engine builders

Informal Banquet7:00 PM
Rear Admiral Earl Mills, Asst. Chief, Bureau of Ships, Navy Dept. will be principal speaker

Tuesday, June 15

Session on Engine Design9:30 AM
"Investigation of Large Diesel-Engine Wristpins"
By Frank E. Faast, Navy Department.
"A New Approach to Stress-Strain Calculations for Connecting Rods"
By Otto R. Spies, Baldwin Locomotive Works

Luncheon and Inspection Trip.....12:00 Noon
U. S. Naval Experiment Station at Annapolis—details as to time of departure, transportation, will be announced later

Wednesday, June 16

Session on New Developments.....9:30 AM
"Present Position and Future Prospects of Diesel Fuels"
By A. L. Foster, Oil and Gas Journal
"The Supersonic Reflectoscope for Inspecting Materials"
By Prof. F. A. Firestone, University of Michigan

Session on Rings and Liners.....2:00 PM
"Recent Developments in Chrome-Plating of Engine Cylinders"
By Russell Pyles, Van der Horst Corp. of America
"Experience with Chrome-Plated Rings"
By Dr. Tracy Jarrett, American Hammered Piston Ring Division, Koppers Co.

Inspection Trip6:00 PM
Tour through largest piston-ring plant, including new metallurgical laboratory and chrome-plating shop—American Hammered Piston Ring Div.

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Ladies Program

Mrs. A. G. Christie Mrs. J. A. Worthington
Mrs. E. B. Whitman Mrs. S. F. Robertson

Other timely technical papers scheduled include: "Present Position and Future Prospects of Diesel Fuels," by A. L. Foster, of the *Oil and Gas Journal*; "Recent Developments in the Chrome-Plating of Engine Cylinders," by Russell Pyles, Van der Horst Corp. of America; and "Experience with Chrome-Plated Rings" by Dr. Tracy Jarrett, American Hammered Piston Ring Division, Koppers Co.

The session on maintenance of Diesel engines

be presented. This trip will highlight the activities of Tuesday, June 15. Another inspection trip of unusual interest will be made on Wednesday evening, June 16, to the plant of the American Hammered Piston Ring Division, Koppers Co. Here the engineers attending will see the manufacture of piston rings from the small precision rings used in aircraft engines to the giant rings used in the low-pressure cylinders of Liberty Ship reciprocating steam engines, the new metallurgical

chairmanship of Mrs. A. G. Christie, is planning a series of events for the entertainment of ladies attending the Conference.

Because Baltimore is a war-boom city and hotel accommodations are in great demand, those planning to attend the Conference are advised to send in reservations promptly and, wherever possible, to arrange for "doubling up" to make the available rooms accommodate as many as possible.

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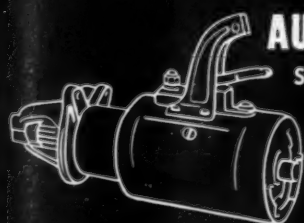
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Auto-Lite systems for Diesels are complete from generator to voltage control to battery to starter. These units are part of a long list of items Auto-Lite's 26 great manufacturing divisions are producing for America's Armed Forces on land, sea and in the air. Diesel manufacturers are invited to consult us on problems involving electrical cranking or generating equipment.

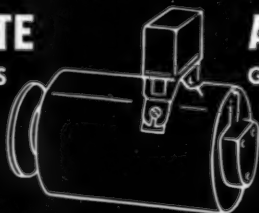
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The Effect of Temperatures in Diesel Operation

By R. L. GREGORY*

THE efficient operation of any Diesel Unit is contingent upon maintaining the proper temperatures. The temperatures of the fuel burned, lubricants used, and cooling agents are all effective, and when operating an air injection unit, the temperature of the air supply is also of importance. First let us take the matter of fuel temperatures.

With the wide variance in present day fuels, temperature play a vital part. If you are fortunate to have a high grade of fuel, it is not necessary to maintain as high a fuel temperature as with the low grade fuels. High grade fuels will operate efficiently under lower combustion temperatures. With the lower grade fuels, high combustion temperatures should be maintained. The preheating of the heavier grades of fuel, especially heavy fuels of lower grade is advisable, particularly during the cold winter weather.

This is not a difficult problem, since most fuel storage tanks are equipped with heating coils for preheating so that the transfer pumps can the more easily handle it. When day or service tanks are used, heating coils can be easily installed and hot water either from the cooling system circulated through the coils, or by use of a jacketed exhaust, a separate supply of water heated and passed by means of a closed system through the coils.

Some plants have low pressure steam available as a heating medium and still others use the hot water method, augmented by steam to step up the temperature of the circulating water. The latter method is generally used in plants where heavier fuels are used.

As previously stated, low grade fuels give more efficient operation when high combustion temperatures are carried. High combustion temperatures may be maintained by heavier loads, higher jacket temperatures and higher intake air temperatures. In the case of higher speed

engines a medium load will generally maintain suitable combustion temperatures. In carrying high combustion temperatures one fact must not be overlooked and that is the maintaining of a good mechanical condition on the liners, pistons and rings. Blow-by is not conducive to the maintenance of high combustion temperatures.

When a unit is operated with a comparatively light load in its daily operation, a poor grade of fuel is generally injurious to the unit, since with a light load combustion temperatures are reduced and consequently the certainty of full combustion of the fuel is reduced. Instances have been known where with a poor grade of fuel in use under a real light load, combustion has failed entirely.

On Engines ranging from 1250 to 3600 hp. using a heavy grade of fuel, many plants pre-heat their fuel from 125 to 150 degrees F. with these Units operating at fairly heavy loads, and maintaining high combustion temperatures, fuel combustion is nearly complete, even with lower grades of fuel.

Lubricants should be carried at temperatures ranging from 120 to 140 degrees F. at all times, and especially during the colder months, since they then flow easier and reduce friction, which in turn has the desired effect of reducing the consumption of fuel per kwh generated.

The jacket cooling water should be kept at as near a uniform temperature as possible and while this temperature varies with the load unless otherwise controlled, this variation should be kept at a minimum by adjusting the amount of cooling water in the heat exchanger. Some plants have considerable difficulty with this phase of operation. Plants which draw their cooling water for the heat exchanger from ponds or lakes often find that in the summer weather, this water reaches a temperature of around 80 degrees F. Unless they are equipped with deep wells, spray ponds or some other device to which they can turn, they have difficulty in maintaining temperatures low enough

in the cooling water of the engine proper to maintain full load or any approach thereto.

With this warm water passing into the heat exchangers, especially in instances where heat exchangers are not cleaned often and scale or corrode up, there is not enough heat transferred from the engine cooling water as it passes through the heat exchanger. On the other hand there is the danger especially in cold weather of getting the engine cooling water too cold, thus effecting the higher combustion temperatures. Efficient operation on most units may be obtained where the cooling agent of the engine is maintained at from 125-140 degrees F.

Preheated air, especially in cold weather, usually improves engine operation. Several methods of heating the injection air are in use, such as drawing the air through radiators (hot water type being preferred) since you can reclaim the waste heat from the exhaust line for heating this water and by use of a small pump circulate it through the radiators. Still another method sometimes employed is to make a sheet metal jacket around the exhaust muffler and use this as a medium of heating the air, the air being drawn through this metal jacket. Scavenging valves, scavenging pump valves, and compressor valves work better when the air is warmer and there is not as much of a tendency for oil accumulation. This preheated air also maintains higher combustion temperatures than the cold air does. Another advantage of preheated air is that of minimizing moisture in the crankcase due to condensation. In many Diesel units, the scavenging air intake runs just beneath the crankcase. With warm lube oil in the crank case and a current of unduly cold air passing around or beneath it, there is bound to be more condensation form in the crankcase than in instances where this air is preheated.

With the foregoing points in mind, one can well see that temperatures can play an important part in the efficient and continuous operation of Diesel engines.

* Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.

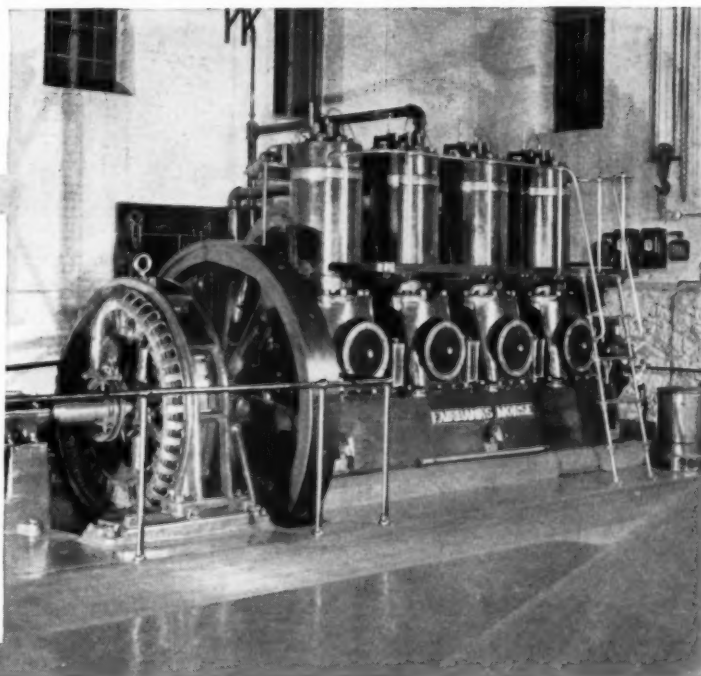


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WAR MAKES BATTERY CARE VITAL IN DIESEL MAINTENANCE

By C. H. ENDRESS*

WAR has made every ounce of many strategic materials almost as precious as life itself. . . . In fact, lives do depend on making every ounce of these materials do their full share toward winning the war.

Diesel engines now in service—in power plants, trucks, tractors, construction machinery, tanks, locomotives, surface ships and submarines—must be kept in service with repairs and replacements requiring the use of scarce materials held to an absolute minimum. This is being done through carefully planned and faithfully executed maintenance programs. But too often, these programs overlook the storage batteries which are indispensable to Diesel engine operation.

Like the Diesel engine which it serves, a storage battery is a machine—a machine which

manufactures electric power by electro-chemical action. And it is made of critical war materials—rubber, lead, antimony, sulphuric acid—which are urgently needed in other phases of war production. Neglect can shorten its life. A few simple preventive maintenance measures can make it serve longer and more efficiently.

A storage battery does not store electricity; it produces it through chemical action when it is being discharged. Charging the battery reverses this chemical action and keeps the machine in good working condition. A battery is a chemical machine that never stops working. It discharges slowly even when it is idle. It is most efficient when it is neither under-charged nor over-charged.

Allowing a battery to remain too long in an under-charged condition is likely to result in permanent damage to the plates through extreme sulphation. When this happens, recharging is hopeless. The battery's service life is prematurely ended, and critical war materials are needlessly wasted. Fig. 1 shows a plate that has been ruined by remaining under-charged too long.

Over-charging is just as dangerous. It causes excessive gassing, with the danger of damage from acid spray. Over-charging also causes excessive internal heat, harmful to plates and separators. Grids in positive plates may disintegrate and buckle. Separators become charred and brittle. Negative plates expand, and may become granular. Buckling of the plates may cause a short circuit through the separators, ruining the battery. Even the battery container itself may be bulged out of shape. Fig. 2 shows the appearance of a plate damaged by excessive over-charge.

One of the most obvious symptoms of excessive over-charge is rapid chronic loss of water, the need for frequent refilling to maintain electrolyte at the correct level. Always regard this as a danger signal.

The only way to keep a battery operating at peak efficiency—the only way to avoid wasting valuable time and critical materials through premature battery failure—is to check the battery at least once every 30 days. These 30-day inspections should not be hit-or-miss affairs. To be fully effective, they must be carefully planned to cover certain essential points that are vital to the efficient operation of the battery. Here is a check list that will prove helpful as a guide for these monthly preventive maintenance inspections: Check specific gravity of the battery electrolyte with a hydrometer at least once a month. If the reading, corrected for temperature, shows specific gravity to be below the minimum limit recommended for the battery by its manufacturer, recharge the battery immediately. If on subsequent inspections the battery proves to be chronically under-charged, either of several possibilities may be indicated.

- (a) The battery itself may be either sulphated or actually worn out. Your dealer can make a capacity test and ascertain whether or not the fault is in the battery itself.
- (b) The voltage regulator or generator may need repair or adjustment to permit a higher charging rate.

Check the level of the battery electrolyte—it should be no higher above the tops of the separators than indicated by the manufacturer's specifications. Frequently dry batteries indicate
(and now please turn to page 64)

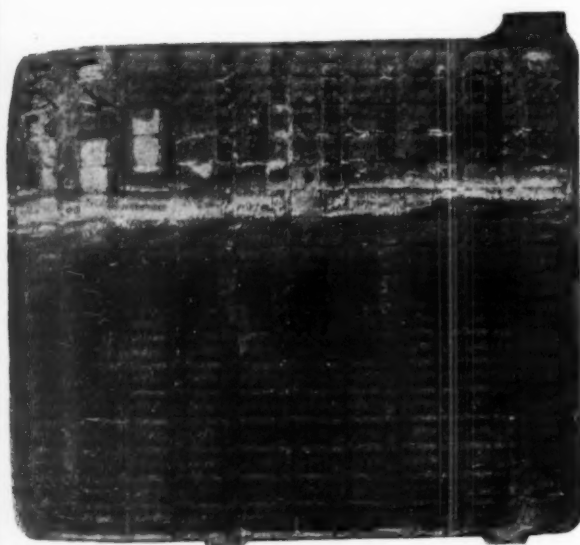


Fig. 1 Plate completely ruined, the result of allowing a battery to remain too long in an undercharged condition.

Fig. 2 Over-charging is just as serious as under-charging. This plate has been damaged beyond all usefulness by excessive over-charge.



Cable Sizes

The voltage drop from excessive resistance in long or undersize cables is a source of serious starting trouble. Diesel starting cables should therefore be of adequate size and as short as the application will permit. Starting control from a remote point should be accomplished by means of a relay switch of ample size and capacity.

RECOMMENDED CABLE SIZES (B. & S. GAUGE)

Total Length of Cable in Feet	ENGINE DISPLACEMENT IN CUBIC INCHES			
	Under 250 Cu. In.	250 to 500 Cu. In.	500 to 750 Cu. In.	750 to 1000 Cu. In.
5	0	0	0	00
10	0	0	00	000
15	0	00	00	000
20	00	000	000	0000
25	00	000	0000	0000

$$\text{Engine Displacement} = 3.14 \times \left(\frac{\text{Bore}}{2}\right)^2 \times (\text{Stroke}) \times (\text{No. Cylinders})$$

Fig. 3 Correct sizes for Diesel starting cables.

* Electrical Engineer, Willard Storage Battery Company.

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Exchange Your Diesel Maintenance Ideas

Conducted by R. L. GREGORY

Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exchange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department—mail your contributions direct to DIESEL PROGRESS.

"Iron Sulphate in Lubricating Oils"

CONSIDERABLE interest has been created by a contribution which appeared in this section of the March issue of Diesel Progress, covering a Diesel Plant's experience with iron sulphate in lubricating oil. Since the appearance of this article, this department has had several letters of comment and inquiries concerning points as presented in the article. One of these letters came from Mr. J. F. Butterworth of Kansas City, Missouri, and since it is typical of those received, we wish to quote it in its entirety and add our comments. Mr. Butterworth's letter follows:

"I was particularly interested in the article on page 50 of the March issue of DIESEL PROGRESS, describing the experience of a Diesel plant Superintendent, with deposits of iron sulphate, formed by the mixing of two incompatible lubricating oils.

I would be very much interested in learning how it was possible to produce iron sulphate as the result of a chemical reaction between the two oils. While I can appreciate the difficulty in adequately explaining the mechanics of such a complicated reaction as is no doubt represented here, I would nevertheless be very pleased to receive further information that would help to better explain such a phenomenon."

Before discussing the points presented in the above mentioned article, the writer wishes to impress upon his readers certain facts. The article as presented in the March issue, gave facts and conclusions as arrived at by that particular plant superintendent and he clearly stated in closing the article, that it was their experience and conclusions and that it did not necessarily mean that it was authentic proof for public statement.

However the subject of the appearance of iron sulphate in lubricating oils in his particular instance has created quite an interest, and the writer has had several letters confirming other experiences which have been somewhat similar. Therefore I have endeavored to obtain the opinions and reactions of several engineers and chemists familiar with the compoundings of different lubricants and present them to our readers as an answer to those communications received.

As Mr. Butterworth stated, it is difficult to explain the mechanics of such a complicated reaction, the more so because of the fact that we are not entirely familiar with all the details which might have caused this reaction in this particular plant. However it has been the consensus of opinion of all those contacted regarding the subject, that it is possible to have iron sulphate present in lubricants, although their opinions differ as to just what the cause might have been.

We are all aware that most engineers do, at some time or another mix lubricants of different brands, due to one cause or another. However because we do this, does not justify the practice and all oil vendors will agree that it is poor practice, especially in cases where these oils are compounded from different crude bases. In ninety nine cases out of a hundred one might not run into difficulties, but the hundredth time might produce disastrous results. This is especially true in the mixing of lubricants for semi-heavy and heavy duty Diesel engines.

If an engineer for some cause or another is compelled to mix two lubricants, it should be done only after he has determined what reaction can be expected from the mixture. In testing oils, one of the first things that oil chemists determine is the reaction of the lubricants under heat.

One engineer consulted on the subject of iron sulphate in lubricants gave the following opinion: "The iron sulphate found in the lubricant might have been a chemical reaction of the additives or detergent as the case might be, which resulted in an end product that attacked

the metal, causing the iron sulphate." Strange things happen, but in the writers opinion, such (and now please turn to page 62)

Another Slant on the Question of Changing Connecting Rod Parting Bolts

I WAS very much interested in the discussion of this question of Connecting Rod Parting Bolts as presented in the March issue of DIESEL PROGRESS, and such discussions as presented by Mr. Boyer and commented on by Mr. Gregory should be of interest to every reader of DIESEL PROGRESS.

During my experience gathered from long years of operating both steam and Diesel units, I have had an opportunity to observe the behavior of parting bolts and it has been my experience that it pays to change these bolts after definite periods of operation, in actual operation of equipment.

I maintain that there may be certain instances wherein a unit may operate year in and year out without any trouble from this source yet safety practice, makes it practical to change these bolts after certain periods of operation.

If parting bolts in connecting rods were installed or could be installed with a drive fit, such as the parting bolts in a coupling connecting the generator shaft to the Diesel unit, they might last indefinitely because they are practically solid metal with such a close fit and there is no chance for side play.

It has, however, been my experience with connecting rod bolts, that no matter how snug the end tightening may be, there is still enough side clearance, after a period of time there is a chance of metal fatigue developing, and regardless of how close you watch the fit you may run into trouble.

I have noted that several Diesel manufacturers adhere to the practice of changing the parting bolts after long periods of operation and I feel that in cases where they suggest that, it is advisable to follow their instructions. They have had the experience and should know whereof they speak.

CHAS. WIGHT, C. Eng.

F. W. Stock Milling Co.

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These Sentries Also Serve

"Submarine on the starboard bow!" A whole ship galvanized into action. Blinker lights flash from ship to ship in the convoy of priceless materials of war.

Deck guns sweep into action and the crew prepares depth bombs for a royal welcome to Herr Schicklgruber's emissaries.

The engine room gets the signal for all the speed her straining diesels can squeeze out, and the battle is on. But below deck there are sentries, too—guarding these vital engines, permitting the use of every ounce of power with safety. These sentries are inanimate assemblies of precision equipment—Sylphon Diesel Engine Controls that prevent engine overheating, warn of any serious drop in lubricating oil pressure.

Sylphon Marine Controls for fighting and commercial ships—for diesel and steam ships—are many, varied. They include the regulation of heating, ventilating and

refrigeration; fresh water heaters; fuel oil heaters; lubricating oil temperatures; diesel engines; de-superheaters; steam jet ejector condensers, etc., etc.

These services, the importance of which is only emphasized by the war effort, will continue to be "well-manned" by Sylphon Equipment in the great new American Merchant Marine of the post-war era.



Sylphon Products include: *Aircraft Controls*—Engine Thermostats, Oil Cooler Thermostats, Fuel Pressure Regulating Valves; Parts for Supercharger Controls, Carburetor Controls, Fuel Injector Controls; *Marine Controls*—for the Regulation of Fresh Water Heaters, Fuel Oil Heaters, Lubricating Oil Temperatures, Diesel Engines, De-superheaters, Steam Jet Ejector Condensers; *Automotive Controls*—Engine Temperature Controls for Tanks and Other Military Vehicles, Trucks and Passenger Cars; *Refrigeration Controls*—Thermostat Mechanisms for Domestic and Commercial Refrigerators; *Industrial Controls*—Temperature, Pressure and Vacuum Controls for Industrial Processes; *Air Conditioning Controls*—for Buildings, Ships, Railroad Trains, Aircraft.



THE FULTON
KNOXVILLE,

SYLPHON CO.
TENNESSEE

Temperature Controls... Bellows... Bellows Assemblies

Exchange Maintenance Ideas

(Continued from page 58)

a reaction is rather doubtful, since most all oil vendors in compounding oils, use compatible additives and detergents, since they are familiar with the practice of some plants in mixing lubricants. Consequently they are pretty particular not to use incompatible agents.

Another chemist sighted the following example which could have caused iron sulphate

in some instances: He said he had found in some plants, that those in charge had a habit of trying to improve lubricating conditions and the condition of the internal parts of their units by treating their lubricants with highly advertised solutions, which were guaranteed to be a cure for various troubles. No one being familiar with these solutions, they might contain chemicals which would combine with others, moisture etc., found in the lubricant, and a chemical reaction would be set up which might prove disastrous to many parts of the unit. As an example he stated this case: For

years a certain plant had been using one brand of lubricant in their crank cases. Suddenly he was called into the plant to ascertain why they were having pitted bearings and other troubles. He analyzed the lubricant and found iron sulphate and other injurious chemicals present. He then inquired whether they had added any solutions or additives of their own and found out that they had purchased a solution which was guaranteed to soften carbon deposits if used in the lube oil and cylinder oil.

He had the engines drained, crank cases and system flushed, the bearing shells were replaced and a new batch of the same lubricant, minus the solution, placed in the lubricating system. The units were placed in operation and the trouble disappeared.

Still a third engineer reported that he had had difficulty with iron sulphate in his lube oil, and he was using only one brand which he had used for years. This engineer went after the trouble systematically and found that he had fuel oil mixing with his lubricant, due to blow by. His units had been required to operate for some time with out time out for maintenance, due to load conditions, and when he was able to take them out of service, his ring and piston conditions were such that he had considerable blowby.

His fuel analysis showed that he was getting a fuel with considerable more sulphur content than his prewar fuel contained. It also contained a larger percentage of salt. The burning of this fuel, with a higher sulphur content produced, sulphur dioxide when it came into contact with the lube oil which had a small percentage of moisture due to condensation.

This resulted in a chemical reaction which produced sulphuric acid. With this condition he could not help but produce iron sulphate, as the acid attacked the metal. After overhauling and placing his units in good mechanical condition, and preventing the fuel mixing with the lubricant, his trouble also disappeared.


This explanation seems the most feasible of all, and in all probability is the cause of most of the instances of iron sulphate when found in lube oils. There may be others to be sure, but we must recognize the fact that an acid condition must exist in the oil in order to attack the iron and produce the iron sulphate, and additives or detergent agents which would produce such a condition are not used by oil vendors.

R. L. GREGORY



Here's What You're Fighting For...

... your way of life! Every man interprets it a little differently, but to us all it means a car, a radio, a refrigerator; the right to those things that make our daily life pleasanter, more convenient, more exciting. Today Weatherhead plants are producing vital parts for planes, tanks, ships, trucks and munitions at the rate of *millions every twenty four hours*. The coming of Peace will find us prepared to join with you in building durable goods the whole world will want as well as many strange new devices that are now being born in the war.

Look Ahead with 

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO
*Manufacturers of vital parts for the automotive, aviation,
refrigeration and other key industries.*

Branch Offices: Detroit, Los Angeles, New York and St. Louis

"GOOD SWEEPIN' SAILOR!"



You with the big brooms—you PC men. You and your GI cans, sweeping the subs clear to hell and gone.

When we say we're with you, sailor, there's no scuttle-butt about it. We speak the same language, although we can't say too

much out loud. ★ We can say this, though—the diesel motor that skims your PC over the swells, through the troughs, under the storms and gales—we built it, we'll bet you! And we build 'em to carry you through. Some of our boys, sailor, are your shipmates.

GENERAL MACHINERY CORPORATION

HAMILTON, OHIO

THE NILES TOOL WORKS CO.

THE HOOVEN, OWENS, RENTSCHLER CO.

GENERAL MACHINERY ORDNANCE CORPORATION

Friction or Hydraulic?

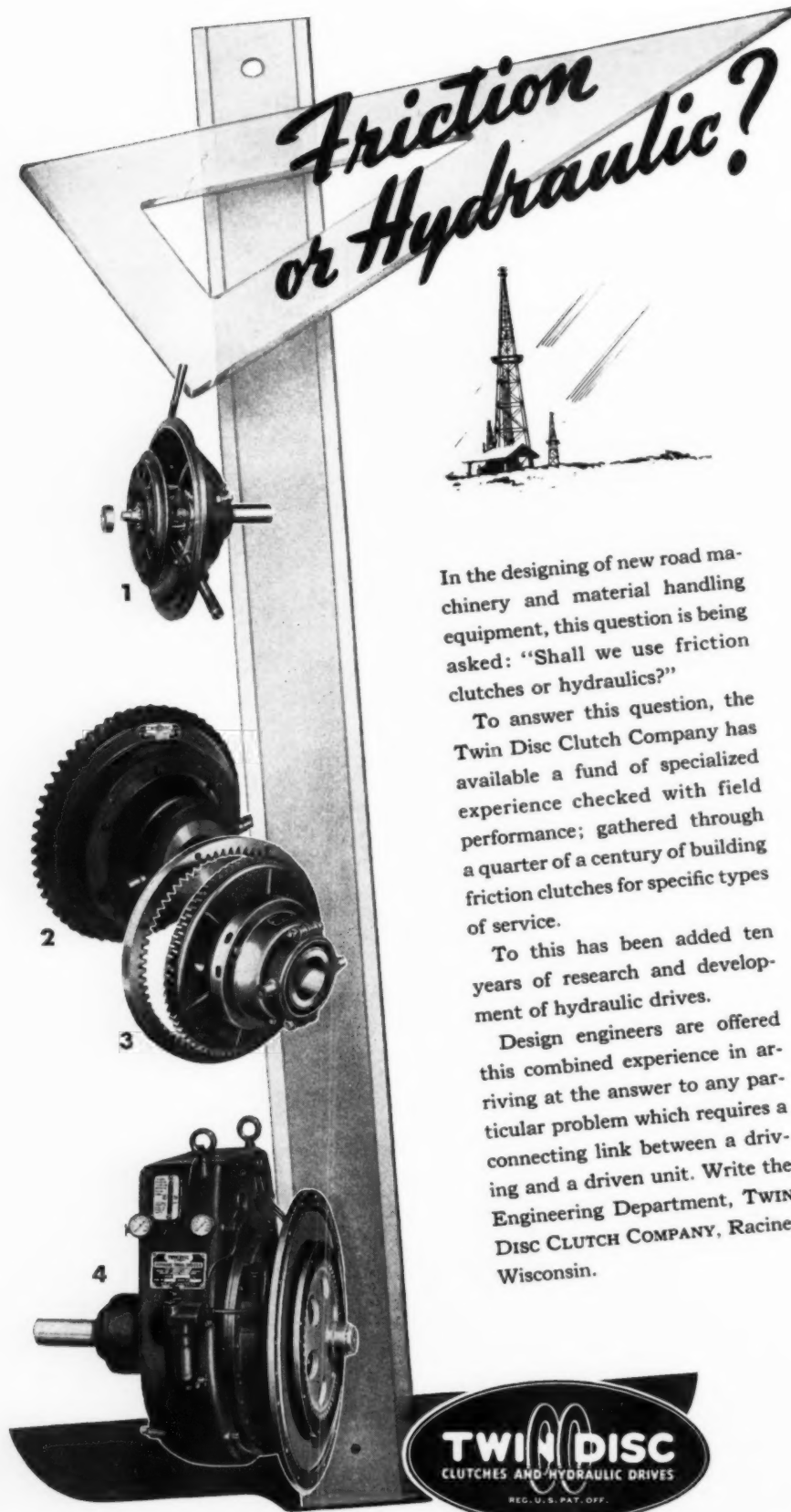


In the designing of new road machinery and material handling equipment, this question is being asked: "Shall we use friction clutches or hydraulics?"

To answer this question, the Twin Disc Clutch Company has available a fund of specialized experience checked with field performance; gathered through a quarter of a century of building friction clutches for specific types of service.

To this has been added ten years of research and development of hydraulic drives.

Design engineers are offered this combined experience in arriving at the answer to any particular problem which requires a connecting link between a driving and a driven unit. Write the Engineering Department, TWIN DISC CLUTCH COMPANY, Racine, Wisconsin.



1—Twin Disc Clutch Power Take-off.

2—Model E Twin Disc Heavy-duty Friction Clutch.

3—Model CL Twin Disc Heavy-duty Friction Clutch.

4—Twin Disc Hydraulic Torque Converter (Lysholm-Smith Type).

TWIN DISC CLUTCH COMPANY • RACINE, WISCONSIN

Battery Care

continued from page 56.

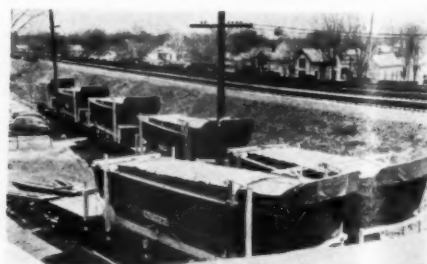
trouble. The voltage regulator may be set too high, or the battery may be leaking and in need of repair or replacement. Always be on the alert against over-filling. Adding too much water to the battery may result in electrolyte being forced out through vent plugs by the gassing and surging that always takes place in an active battery. The resultant acid spray has a damaging effect on vital electrical and other parts with which it comes in contact.

Make sure that the battery and battery compartment are clean and dry, and that terminals are clean and tight. Clean terminals and posts with a wire brush and a solution of baking soda and water. Be careful that none of the soda solution gets into the battery. Cover terminals with a thin coating of vaseline to prevent corrosion.

When a healthy battery won't hold a charge, have the electrical system checked for leaks. Make sure that the electrical system is carefully and adequately wired in order to prevent unnecessary electrical losses. All leads should be protected. Necessary splices should be carefully soldered and thoroughly insulated. Wiring should be heavy enough to carry the maximum current required. Under-sized cables are a frequent cause of poor Diesel engine starting. Fig. 3 gives the recommended cable sizes for Diesel engine starting.

Preventive maintenance for Diesel engine batteries costs so little in time and money. Yet it pays so much in longer battery life and greater efficiency of both battery and engine. And it is one way in which all owners and operators of Diesel engines can—and should—help conserve the critically scarce materials that are so vital in winning the war.

LCVP Diesel Landing Boats



Lineup of 36 LCVP Landing Boats being shipped from a midwestern plant. All are powered with Gray Marine Diesels.



In the World's Busiest Port

PIERCE GOVERNORS Are on Guard in the "Harbor Fleet"

● With New York Harbor's traffic at an all-time peak, and fewer tug-boats to keep it moving, these sea-going switch engines are working on a 'round-the-clock schedule to speed the day of victory.

Newest of the boats of the harbor fleet are Diesel-powered, and here you will find Pierce Flyball Governors protecting the powerful engines against destructive overspeeds, and providing automatic regulation of the power required as treacherous currents change load conditions.

It's just one of the many widely-varied and vital war-time assignments that Pierce Governors are carrying out with traditional dependability. Pierce Flyball Governors respond instantly, and unfailingly, to load changes—and Pierce "know-how,"

both in manufacture and materials, assures long service life.

As the world's largest governor builders, Pierce is meeting and solving new governing problems in war equipment of many types. From this experience will come, inevitably, further advances in the art of close, split-second governing on internal combustion engines. Pierce engineers are ready, always, to consult with you on your governor problems.

The governor illustrated is a standard Marine type Pierce Governor, gear-driven, with integral speed change quadrant which permits governed control of engine throughout its complete range.



THE PIERCE GOVERNOR COMPANY, 1603 OHIO AVENUE, ANDERSON, INDIANA

Pierce Governors

STANDARD SINCE 1913



ADECO NOZZLE TESTER For Economical Maintenance

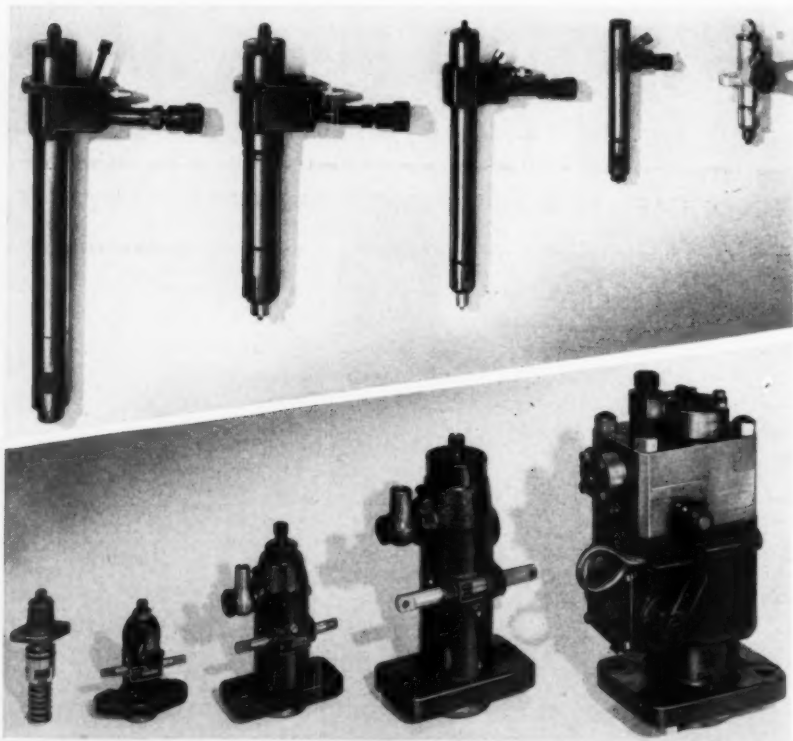
America's most widely used Nozzle Tester enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Compact, portable, sturdy, precision-built. Pressures up to 10,000 p.s.i. Tests both large and small injectors. Avoids costly delays and possible damage to engine. Best for economical maintenance. Write for new illustrated bulletin.

ADECO "KNOW-HOW" BRINGS YOU THE FINEST IN DIESEL FUEL INJECTION EQUIPMENT



Write for complete
Adeco Catalog

Back of every Adeco product is a thorough knowledge of diesel requirements, gained through years of experience in serving the diesel industry. This understanding combined with Adeco's wide research and manufacturing facilities provides a most dependable source for the finest in diesel fuel injection pumps, nozzles and nozzle holders.



AIRCRAFT & DIESEL EQUIPMENT CORPORATION

4401 NORTH RAVENSWOOD AVENUE

CHICAGO, ILLINOIS

Army-Navy "E" To Geo. D. Roper Corp.

APPROXIMATELY 2000 people, including Roper employees, their families, city, county and state officials and members of the Armed Forces gathered in the plant of the Geo. D. Roper Corporation, Rockford, Illinois Friday, April 23 to witness the presentation of the Army-Navy "E" pennant and individual "E" pins to employees.



Left: Col. Wm. L. Plummer, Commanding Officer Homestead Air Base and right: Stanley H. Hobson, president, Geo. D. Roper Corporation; holding the Army-Navy "E" pennant awarded for high quantity and quality production of war materials.

Colonel William L. Plummer, in peace times Roper district manager with headquarters in Atlanta, Georgia, made the presentation of the "E" pennant. Colonel Plummer is commanding officer of Homestead (Florida) Air Base. In behalf of all Roper employees, Stanley H. Hobson, president of the company, accepted the flag.

Lieutenant (S. G.) E. B. Bremer, of the U. S. Navy presented "E" lapel pins to ten of the oldest Roper employees including Stephen Bardelli, Harry Brunner, Sr., Sam Cudia, Richard DeLong, William Eickmeyer, Felix Lamb, Norman Smith, Ralph Thomas, George Wright, Walter Yarnall and two women employees Miss Genevieve Dyboski and Mrs. Ida Thompson who have members of their families in the Armed Forces.

Roper personnel director, Sol W. Weill, acted as Master of Ceremonies while the Medical Replacement Training Center Band and a color guard from Camp Grant provided a military setting.

Robstown, Texas Municipal Power Plant Designed and Built by Garrett Engineering Company

GARRETT Engineering Company, consulting and supervising engineers, of Houston, Texas designed and built the Robstown, Texas Municipal Power Plant and through its president, Mr. M. T. Garrett, was instrumental in supplying material for the splendid description and illustrations of this plant, which appeared in the May issue of DIESEL PROGRESS.

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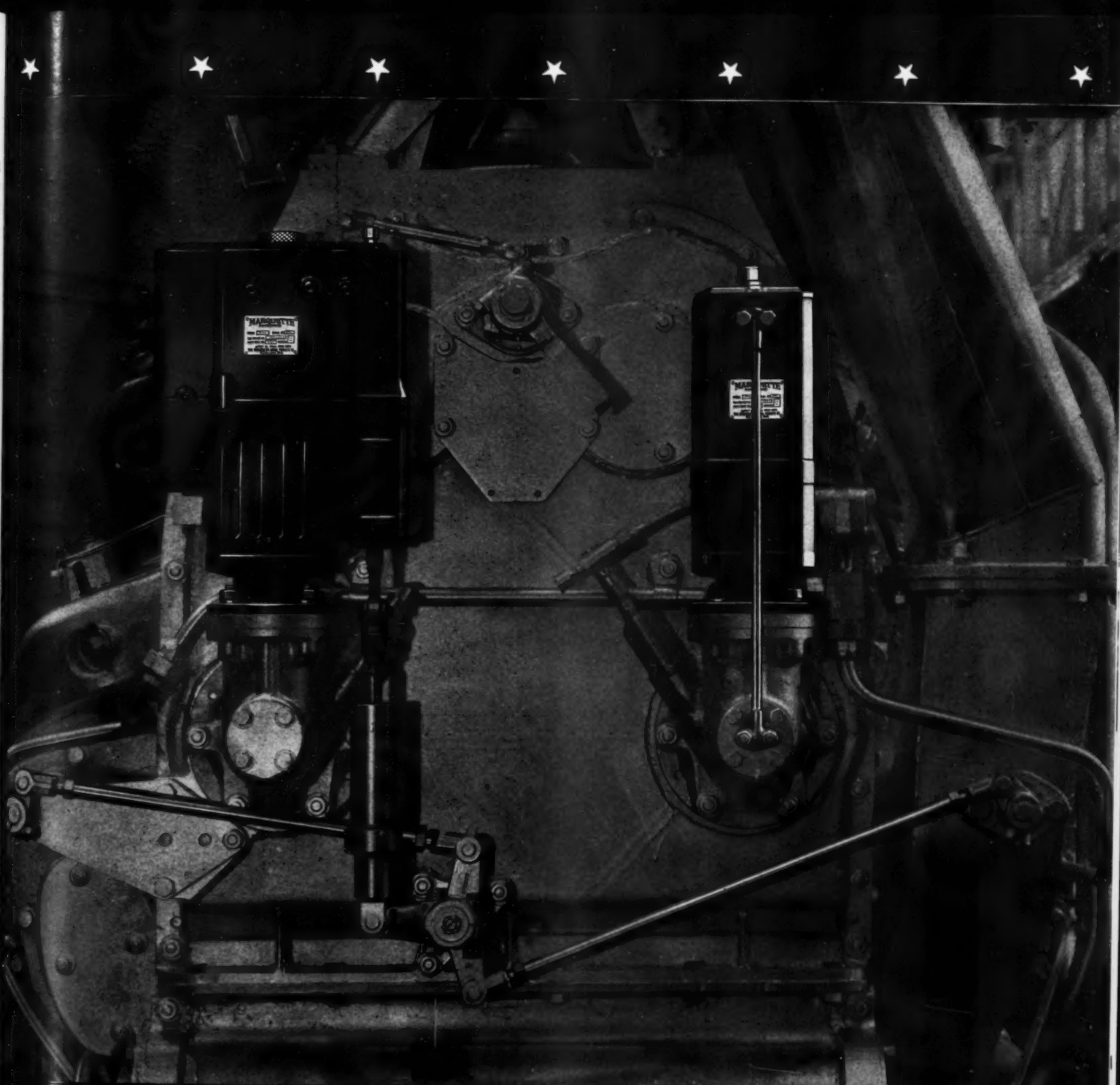
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HYDRAULIC GOVERNORS and OVER-SPEED TRIPS



The **Marquette** METAL PRODUCTS CO.
CLEVELAND, OHIO



ALL HONOR to the men of the Merchant Marine

★ Vigilance—nerve-wracking, relentless—in engine rooms, on bridges, at crew stations. This is the strain they are under. Night and day, they guide the merchant ships with their precious cargoes through icy spray or scorching heat. ★ They are weaving a global web that shall stifle and destroy the Axis beasts.

★ Liquidometer's contribution to help lighten the task of these fearless men of the sea are gauges. One—the Levelometer, a dial type hydrostatic fuel level gauge that gives dependable, accurate, easily read indication of the liquid fuel level. Two—a Draft indicator that ★ gives the pilot or engineer exact indication of the vessel's draft at all times. Three—the Rudder Angle indicator (hydraulic or electric) ★ that responds to the slightest movement of the rudder and gives instant, accurate rudder indication on the bridge.

★ The results of years of experience in the designing and manufacturing of instruments for the Maritime Commission and the Navy ★ are incorporated in all Liquidometer Gauges and Indicators.

★ Buy War Bonds—an investment in Victory ★

★ **Liquidometer Corporation** ★
MARINE DIVISION

★ 41-17 37th STREET, LONG ISLAND CITY, N. Y. ★

Timely Tips on Diesel Operation Given by Ralph L. Boyer

IN a recent address before the American Society of Mechanical Engineers, and the Society of Naval Architects and Marine Engineers at Hotel Astor, New York City, Ralph L. Boyer, Chief engineer of the Cooper-Bessemer Corporation, offered some valuable and timely suggestions on the installation and maintenance of Diesel auxiliary generator sets.

Drawing on his broad knowledge of research, experimentation, and practical experience in Diesel engineering, Boyer told how back pressures can be overcome in Diesel auxiliary exhaust systems; why and when centrifugal pumps should be considered for water circulating systems; the proper type of lubricating oil pumps to fit specific conditions, and many other contributing factors that save time and are conducive to the best operating results.

In discussing exhaust system problems, Boyer said, "A common and easily explained practice is to pay a great deal less attention to where the auxiliary engines may be placed, with the result that the exhaust line is frequently extremely long and of a tortuous nature. High back pressures usually result, and in a number of cases it has been necessary to make rather radical changes in the exhaust system, to lower the back pressure sufficiently to permit the auxiliary engines to pull the required overload." He also brought out some of the reasons why difficulties are experienced when installing high speed engines to parallel with the lower speed units. "The high speed engine automatically needs comparatively small wheel effect and therefore is usually designed that way," he said. "Several of these high speed engines will parallel satisfactorily, but when installed in parallel with slow speed units with heavy wheels difficulty is frequently experienced due to the fact that the high speed unit having less wheel reacts more quickly to load changes and therefore causes a considerable amount of surging. This should be taken into account when combined with two different types of units."

Copies of Boyer's address in the form of illustrated reprints are available to those interested. They can be obtained on request from The Cooper-Bessemer Corporation, Mount Vernon, Ohio.



THE BABY'S NAME IS

...FUTURE!

On every battlefield, drops of diesel oil are supplying power for artillery phones, ship radios, submarine and aircraft repairs. And on these same fronts, Americans are supplying the mind and muscle and courage that battle needs . . . But have you ever realized that in each man's arm there rests a baby? Its name is Future. His future . . . and ours. It's there, content and waiting, day and night.

Each fighting man thinks of that Future differently. To one, it is the new little son he left behind. To another, the home he's going to have . . .

To us, it's a lusty, work-hungry infant that will be ready, with Victory, to work hard for us and our returned fighting men. Diesel power . . . for cheaper lighting . . . faster transportation . . . better portable power for us and all the neighbor nations of the world.

That's the baby our employee holds as he works, at the machine tool, the drawing board, the assembly line and shipping room. Rogers Diesel and Aircraft Corporation, 1120 Leggett Avenue, New York, N.Y. Divisions: Hill Diesel Engine Company, The Edwards Company, Edwards Aircraft Products, Inc., Ideal Power Lawn Mower Co.



ROGERS

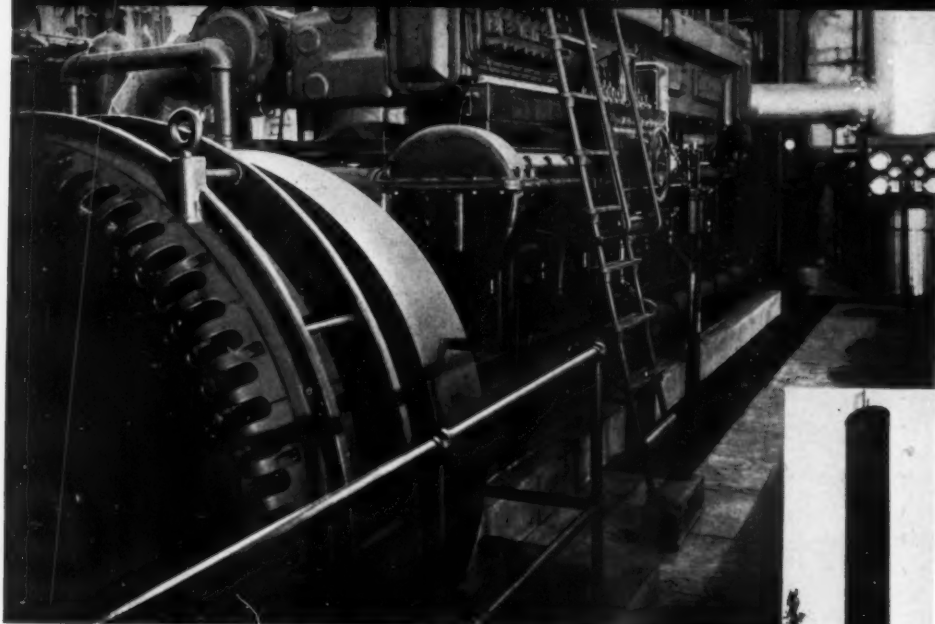
DIESEL AND AIRCRAFT CORPORATION

Diesel Engines, 5 to 2000 h.p. • Gasoline Engines • Generator Sets • Generators • Power Units • Switchboards
Pumping Units • Hydraulic Aircraft Equipment • Recoil Mechanisms • Power Mowers • Power Brushes
Snow Removal Equipment • Streamlined deluxe Railway Motor Trains • Diesel Locomotives



TRADE MARK REG.

4 Big F-M Diesels



An 8-cylinder, 1400 hp. F-M Diesel in the Lafayette, Indiana plant.



Model RT, surface-mounting "Alnor" multipoint pyrometer.



with
"ALNORS"

"Alnor" pyrometers protect the four Fairbanks Morse Diesels in the Lafayette, Indiana Municipal power plant. There are thirty cylinders in these four engines, developing a total of 4,250 hp., and the continuous, efficient performance of each cylinder is vital to community life and welfare. That's why a multipoint "Alnor" is installed for each engine as is the case in an impressive majority of Diesel plants.

Specify and Buy "Alnor"



Illinois Testing Laboratories Inc.

147 WEST HUBBARD STREET CHICAGO, ILLINOIS

Manufacturers "Alnor" and "Price" Pyrometers The Products of 43 years' experience

Ladish Drop Forge Co. Gets Army-Navy "E" Award

THE Army-Navy "E" Production Award was presented to the men and women of Ladish Drop Forge Co. on Wednesday, April 14, 1943.



Holding the Army-Navy "E" Flag presented to the Ladish Drop Forge Co., left to right are Lt. Col. Edward H. Bowman, U. S. Army Air Corps; Herman W. Ladish, Chairman of the Ladish Board of Directors; Otto Retzlaff, employee representative; Captain D. D. Dupre, Commandant, Naval Officers Training Corps, Marquette University.

The short, business-like presentation ceremony was made in the plant. Victor F. Braun, President of the company, made the address of welcome. The presentation address was given by Lt. Col. Edward H. Bowman of the U. S. Army Air Corps, and the acceptance address by Herman W. Ladish, Chairman of the Ladish Board of Directors. A token presentation of the individual Army-Navy "E" pins was made by Captain D. D. Dupre, Commandant of the Naval Officers Training Corps at Marquette University, to Otto Retzlaff, who accepted on behalf of the 3,400 Ladish employees and struck a heart-warming note of confidence and determination in a stirring address of acceptance. Appropriate music was supplied by the Cudahy High School Band. After the final speech was made and when the last note of the National Anthem was sounded, the men and women of Ladish went back to their work, determined to surpass their already excellent production record.

FOR VICTORY



BUY
UNITED
STATES
WAR
BONDS
AND
STAMPS



No one would think of carelessly leaving several thousand dollars in cash lying around unprotected.

A Diesel engine may well be the equivalent of many thousands of dollars, not only in original cost, but in terms of power and the useful work it does.

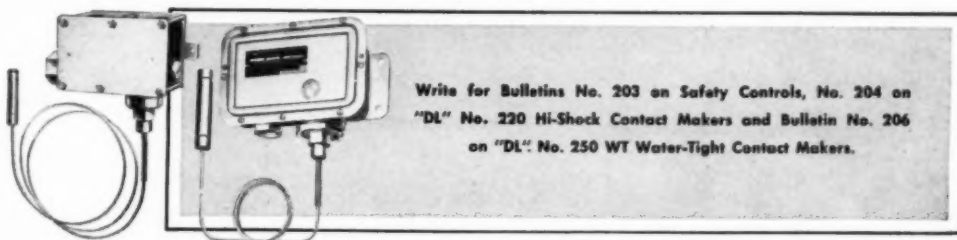
Therefore, it's just plain common sense to protect your investment in power as carefully as you do your cash.

Overheated cooling water or low lube-oil pressure can result in serious damage to an expensive engine, loss of money, and time lost to the war effort.

Your investment in Diesel power can be protected by the installation of "DL" Engine Safety Contact Makers in combination with a suitable alarm system to warn you when a dangerous condition exists or is imminent.

"DL" products are backed by the experience of many years in the manufacture of precision equipment that has earned a world-wide reputation for excellence.

Many "DL" Contact Makers have been especially designed for use on our fighting ships and those of our merchant marine. If you are in need of this type of equipment, we will send you full information on request.



Write for Bulletins No. 203 on Safety Controls, No. 204 on "DL" No. 220 Hi-Shock Contact Makers and Bulletin No. 206 on "DL" No. 250 WT Water-Tight Contact Makers.

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Division of AMERICAN Radiator and "Standard" Sanitary Corporation

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG



"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • Radiator Valves and Balancing Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves and Refrigeration Accessories • Air Filters • Stationary and Locomotive Lubricators

Diesel School for Secretaries - World War II Style

Remember when she couldn't change the ribbon on her typewriter? Now she can change the oil in your Diesel or take up the bearings.



Instigator of the Cummins Engine Company's training school, Service Manager C. D. Cummins dictates a complicated memo to his secretary, Miss Catherine Winton. A "graduate" of her boss' school, the technical terms are duck soup for her now.

**"IT'S NOT IMPORTANT
UNLESS IT WILL HELP
WIN THE WAR."**

**MISTER,
you said it!**

This is no time for "hair-splitting" or "gingerbread". Chrome trim and plaid upholstery don't fit in with tank-killer turret guns and caterpillar treads.

And *how important* anything is must be measured in terms of "service rendered" where it counts most.

Our product, the VISCO-METER*, built up quite a service record in government use through pre-war years. Soon after Pearl Harbor our entire production capacity was enlisted to serve with the gasoline and Diesel engines consigned to Uncle Sam's war uses.

A simple 12 ounce piece of mechanical precision the VISCO-METER* is doing an *important job*—and doing it

well—guarding these needed and costly engines against lubrication failures. No need to go into the importance of lubrication—that's recognized. The important thing is: *only* VISCO-METER* can tell visually, (via a continually indicating gauge) the viscosity or lubricating value of the crankcase oil while the engine is in operation. Only VISCO-METER* can warn in advance of failure—preventing damage and loss of service. So the VISCO-METER* *is important* and is helping to win the war.

In peacetime the VISCO-METER* will continue to play an important role. If you are looking forward, a VISCO-METER* engineer can be most helpful.

VISCO-METER
CORPORATION GROTE ST., BUFFALO, N. Y.

*Fully covered by U. S. and Foreign Patents

WITHIN the brief period of a year or two, women in industry have become as much a part of the American Scene as hot dogs at a ball game. Every radio program has its gag about Wilma the Welder . . . every newsreel its closeup of Dora the Drill Press Operator in her slacks by Hattie Carnegie or turban by Schaparelli. Rosa the Riveter is building ships faster than they can cork the champagne. Make no mistake about it, these women are doing a vital job and doing it well.

But what about the millions of women in industry whose day-to-day tasks—while devoid of the spectacular—are no less essential to the increased out-put of munitions and all of the material necessary to the prosecution of a war? For instance, what about the secretary to the service manager or purchasing agent, or the dictaphone operator, or the comptometer operator in the accounting department? Where do they—and *how can they*—fit into the overall picture of all-out production.

As was doubtlessly the case with industries everywhere, this problem began to inject itself into the thinking of executives of the Cummins Engine Company, builders of diesel engines, even prior to Pearl Harbor. All through 1942, production demands doubled and redoubled. The matter of personnel adequate to meet the need grew proportionately . . . office and clerical personnel as well as production personnel.

As a matter of fact, the procurement of employees was perhaps more difficult in the case of this company than in many other plants. Situated in the comparatively small city of Columbus, Indiana, many attractive jobs in neighboring metropolitan areas offered a tempting

... That ships can move Materiel-Munitions-Men



I AM PROUD TO FIGHT...

I began life as a 33,000lb. white-hot billet of fine steel. Forging Hammers and Presses, Heat-treating Furnaces, Machines and Men trained me down to fighting weight . . . around 10,000 lbs. ringside.

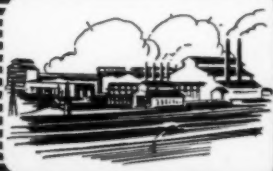
I drive Liberty Ships, Submarines, P-T Boats, the Diesels of War.

I am proud to fight for the United Nations . . .

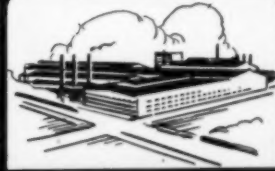
I was wrought, forged, seasoned and machined by expert designers, engineers and craftsmen at Erie Forge Company.

My counterparts..Shafting, Connecting Rods, Crankshafts, Steel Forgings and Castings..are good tough fighters for the battle of the Nations and for Industry.

THROW YOUR SCRAP INTO THE FIGHT



ERIE FORGE COMPANY, ERIE, PA.



lure to residents of the community, particularly the "young and single" girls newly out of high school, business school or college who were needed to fill office positions. With the introduction of priorities and huge government orders bristling with complex specifications, new openings of this type were being created rapidly.

Granting that they would be able to hold their own in this highly competitive employ-

ment market, still another headache presented itself to company officials.

Although this growing army of women was unquestionably competent in unscrambling their shorthand pot hooks and in manipulating their calculating machines, they were still and all complete strangers to a Diesel engine and the weird-sounding vernacular that sprinkled correspondence, invoices and the like. It would be nice, these same executives mused, if the dif-

ference between a gasket and a crankshaft could be impressed upon these eager and willing neophytes.

This, generally speaking, was the state of things when—some months ago—the Cummins Engine Company was called upon to institute training classes for Diesel instructors and men of the armed forces. These classes, following in general pattern established throughout industry, were quickly set up. A special classroom was provided and through the use of simple lectures, slide films, engine cutaways, etc., it was possible in a comparatively few sessions to give students a brief but thorough schooling in the operation and maintenance of Cummins Diesel engines.



The same Boss' secretary used to stumble over such terms as "cam rocker lever assembly" ... now knows just how, why and where it goes.

This school was established under the direction of the company service manager, C. D. Cummins. Greatly impressed by the ease and speed with which these students assimilated the intricate Diesel engine lore, it was a logical conclusion that he should ask himself, "why couldn't the girls in the office do the same thing?"



While other Cummins coeds look on, this mechanically-minded miss in the center puts a wrench to 150 "horses."

As events have since proved, they could and did. Today, virtually every woman employed in a clerical capacity by the Cummins Engine

Backed by Extensive Field and Laboratory Tests

CONTINUOUS PERFORMANCE AT SPECIFIED CAPACITY

is true of all **ROSS** *Coolers*

Ross' experience in determining and analyzing individual lube oil and jacket water cooler problems is unique in the heat exchanger industry.

For over a quarter century high temperature and high pressure exchangers and condensers for chemicals, oils and complex gas mixtures have been designed and fabricated to meet the most exacting requirements of power plants, refineries, chemical industries, etc. This has involved extensive testing of new equipment in the shop and laboratory, and performance tests in the field during and after considerable use.

Through such broad experience, a wealth of design data has been accumulated and kept up to date. When applied to your own operating conditions, this type of performance information results in a design that insures continuous performance at the specified capacity.

Manufacturers of All Kinds of Heat Exchangers for over a Quarter Century

ROSS HEATER & MFG. COMPANY, INC.

Division of AMERICAN Radiator and "Standard" Sanitary Corporation

MAIN OFFICE AND PLANT 1409 WEST AVENUE BUFFALO, N. Y.

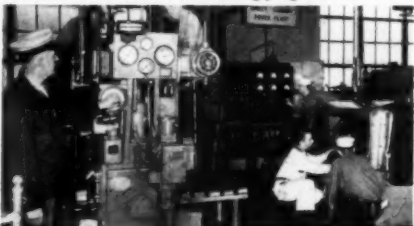
Mission Completed

ON ASSIGNMENT #30

When the groups of Coast Guardsmen graduate from Hemphill Diesel Schools — they are ready to man and handle the Diesel Powered patrol boats that are death to our enemies and emissaries of mercy to those in distress during peace or war.



Above left: Typical high-speed Diesel used for training at Hemphill Schools. Above right: Slow speed, heavy duty Diesels are included in the training program.



Electric generating plant operation and maintenance are thoroughly studied by Hemphill students.



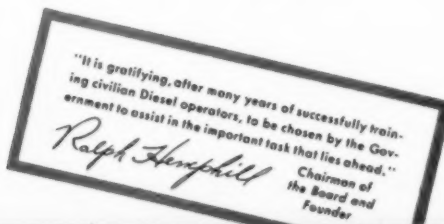
HEMPHILL DIESEL TRAINING OF COAST GUARD AND NAVY PERSONNEL is thorough!

Theory, yes, but classroom instruction on the principals, design and structure of Diesel engines is augmented by *actual shop training*—learning how to make small parts and to handle pipe fitting, electric wiring, and other voyage repairs. Engines and training equipment in Hemphill Schools, parallels the tools, machines and engines in actual service.

In addition, the New York Hemphill Schools' "MS Brisbane," gives Coast Guard personnel in Training there actual experience on a Diesel-powered boat. They learn ship's telegraph and bell signals, engine operation and servicing under actual ship-board conditions, how to handle fuel transfer pumps, battery systems and other equipment.

Marine, Generating and Stationary Power Plants are an open book to Hemphill-trained men. Hemphill Schools in Los Angeles, Chicago, Memphis and New York are now running full capacity preparing men to handle Army, Navy and Coast Guard Diesel-powered equipment—training that is *vital now* and will be valuable to these men after the war when Diesels will again be put to work for peace time power on land and sea.

Home Study Also Available— If it is not possible for you to attend a Hemphill School, you can lay the foundation of a Diesel career with Hemphill's Home Study Course. Write today for complete information.



HEMPHILL INSTITUTE OF TECHNOLOGY

Operating the Hemphill Diesel Schools at

NEW YORK
3128 Queens Blvd.
Long Island City

CHICAGO
515 So. Western Ave.
***AMERICA'S ORIGINAL EXCLUSIVE DIESEL TRAINING INSTITUTION**

LOS ANGELES
1601 So. Western Ave.

MEMPHIS
421 Monroe Ave.

Company has received a primary training course in Diesel engine mechanics. Every day, a group of ten or twelve of them slip on their mechanics' shop-coats and—in this same service men's classroom—see for themselves what makes a diesel run.

Each takes her turn at removing or assembling cylinder heads, rocker arm assemblies, fuel pump . . . the whole works. These lab sessions are augmented by written examinations based on lectures which, in the simplest possible

terms, explain the nature and sources of energy, the steam engine, gasoline engine, and finally, the Diesel engine . . . more specifically, the Cummins Diesel engine.

This secretarial school—World War II version—is conducted on an entirely voluntary basis. Any woman who does not care to expose her new manicure or finger wave to the hazards of No. 2 furnace oil is perfectly free to say so. Only one or two such cases have occurred to date, however, and of the upwards of two hun-

dred girls and women who have attended the school so far, almost all have described it as a very interesting and invaluable experience. The course covers about twelve hours of lab work and lectures and this is spread over the working day for a period of about two weeks, usually depending on how much time the women are able to take from their regular duties. All classes are held during working hours on the company's time.

The training has, according to Mr. Cummins, had particularly fine results in the service department where the work involves all of the detail created by the handling of thousands of parts ranging from gaskets to crankshafts. Incorrect invoices are less likely to escape the notice of a girl who knows now—from her own personal experience in the laboratory—that a crankshaft is a huge, costly, finely polished piece of steel that could not possibly sell for the five cents indicated on the invoice.

Still another dividend may be paid by this program before the war comes to an end. Although designed primarily as an educational measure to increase office efficiency, company officials do not discount the possibility that these same women may yet have to take a full-time job on the assembly line or in the service department to replace skilled male workers who may be called to the armed forces. Thus the program has produced a backlog of potential workers who, with additional training, provide insurance against idle production lines. The company hopes this will never be necessary. But they know that this is war . . . and that, in time of war, anything can happen.

Diesel-Electric Locomotives in Switching Service



G-E Diesel-electric locomotive, 380 hp., 44-ton for the Atlantic and East Carolina Railway Co.

MANY large locomotives have been released for heavy-duty war work by diesel-electric switchers such as this General Electric 44-tonner recently delivered to the Atlantic and East Carolina Railway Company. This Cummins engined locomotive is in switching service at New Bern, North Carolina.

EXPERIENCE

Proves that Blackmer
Rotary Pumps are
dependable Equipment

in

LUBE OIL and FUEL OIL SERVICE

FOR DIESEL INSTALLATIONS
MARINE—STATIONARY—TRANSPORT

Power Pumps — 5 to 750 GPM — up to 300 psi.
Hand Pumps — 7 to 25 GPM — 54 Models

Blackmer Nationwide Pump Engineering Service is at your call on
all problems involving rotary pump applications.

Bulletins FREE to DIESEL MEN

No. 301—FACTS about ROTARY PUMPS
No. 120—MARINE ROTARY PUMPS

Write Blackmer Pump Co., 1966 Century Ave., Grand Rapids, Mich.



BLACKMER Rotary PUMPS

"BUCKET DESIGN"—SELF-ADJUSTING FOR WEAR

Rogers Diesel and Aircraft Corporation Appoints Fred L. Hall As Vice President

IN AN expansion of its plans to coordinate and expedite its war-work contracts, the Rogers Diesel and Aircraft Corporation, New York, N. Y., has appointed Fred L. Hall as Vice-President in Charge of Sales. The announcement carries the effective date of May 1, 1943.



Fred L. Hall

Mr. Hall, who has been Sales Manager for the Bendix-Westinghouse Automotive Air Brake Company for the past six years, started his career with Westinghouse in 1927 as an apprentice in the Union Switch and Signal Company in Pittsburgh. A few months later he was transferred to the parent company, Westinghouse Air Brake Company, to serve as field inspector for a short time, and then as mechanical expert in Cincinnati, Philadelphia and Minneapolis. In 1929 he was appointed general field representative of the Automotive Division.

With the formation of the Bendix-Westinghouse Automotive Air Brake Company in 1930, Hall was made General Service Manager. He held this appointment until 1932, when he was advanced to the position of Eastern Manager, with headquarters in New York. In 1937, he was recalled to Pittsburgh as Sales Manager.

Since 1929 Mr. Hall has been active as consultant to the various Army Motor Transport and Combat Vehicle groups. In 1941, he was made Director of Defense Activities for the entire Bendix-Westinghouse organization and held this position until his recent resignation. He

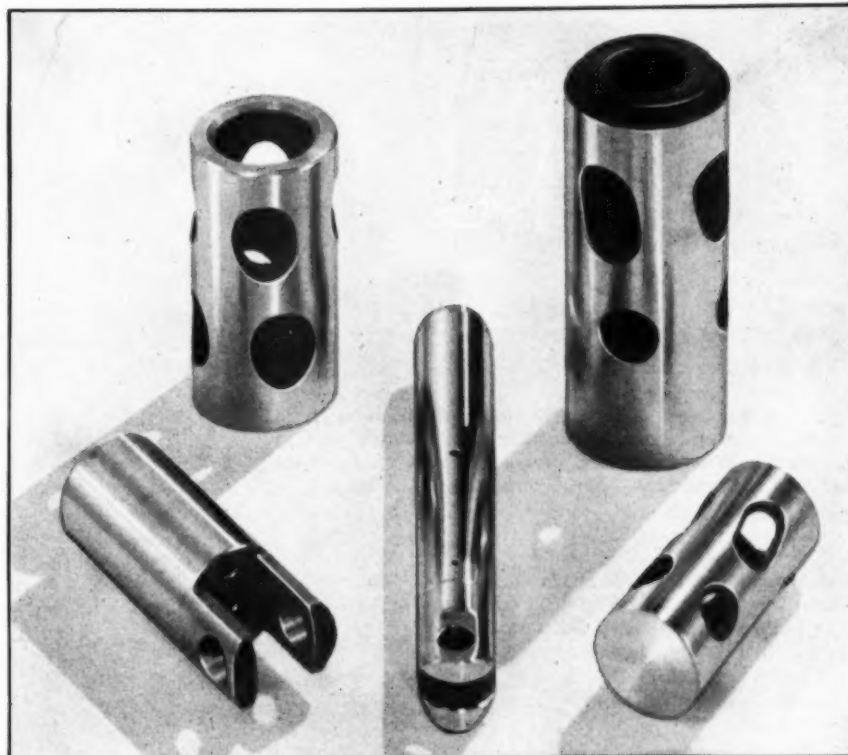
has been a member of the Society of Automotive Engineers since 1932, and has been active in the functions of the American Trucking Association and the Army Ordnance Association.

In addition to his immediate concern with governmental contracts, Mr. Hall will be active in formulating plans and charting the course for postwar sales of the entire Rogers Diesel and Aircraft organization, which includes the Hill Diesel Engine Company, Lansing, Michigan; Edwards Company, Sanford, North Carolina,

and Ideal Power Lawn Mower Company, Lansing, Michigan.

R. J. (Chief) Bender Joins Navy Reserves

R. J. BENDER, known to his business associates and friends as "Chief" Bender, for the past eleven years Combustion Engineer for the Sinclair Refining Company in Chicago, Illinois, and editor of the monthly SINCLAIR FIRE-BOX, has joined the Navy Reserves as Lieutenant.



CHICAGO TAPPETS - - AIRCRAFT QUALITY PORTED CAST IRON and STEEL ROLLER TYPE

Serving our Armed Forces in Diesel Engines of every Type and doing a **better** job because of complete Quality Control.

Chicago Tappets are made to operate under "front line" conditions, free from the necessity of replacements or service.



We also specialize in the manufacture of Steel and Cast Iron Mushroom Type Valve Tappets, Connecting Rod Bolts, Push Rods and Valve Spring Retainers, all made to Aircraft Quality Standards.

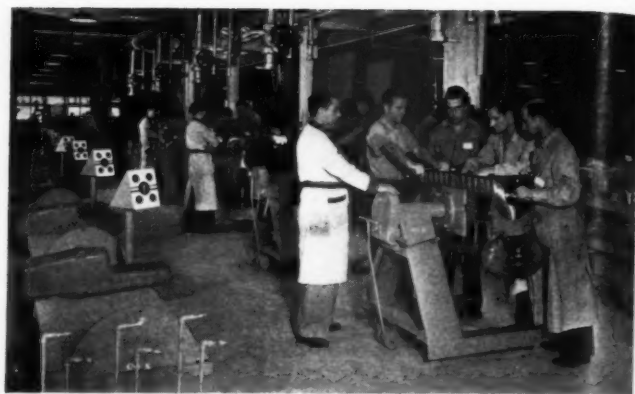
THE CHICAGO SCREW CO.

ESTABLISHED 1872

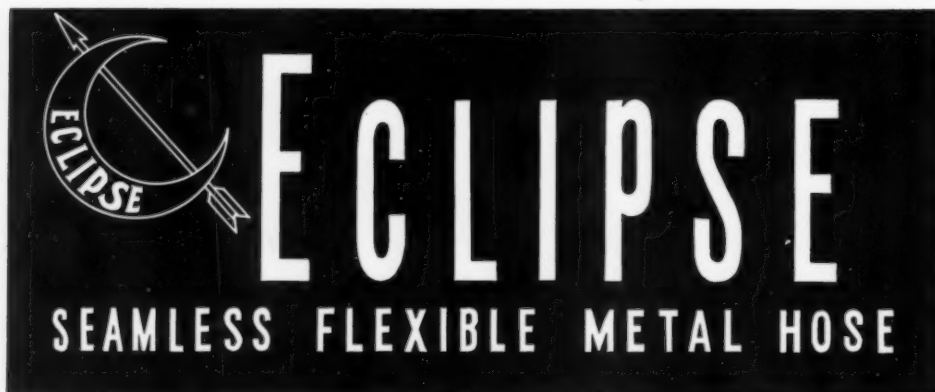
1026 SO. HOMAN AVENUE

CHICAGO, ILL.

**GENERAL MOTORS,
DETROIT DIESEL DIVISION
SCHOOL TRAINS UNITED
STATES COAST GUARD
MECHANICS**



Here with one instructor for every four students the Coast Guardsmen learn repair on a special assembly line in the new school.



Eclipse Seamless Flexible Metal Hose, manufactured of selected alloys and specially heat treated, is light-weight and durable. Wherever hose connections of these characteristics are needed—there is an ECLIPSE product to meet the conditions.

- ★ Water Cooled Exhausts
- ★ Alfol Insulated Dry Exhausts
- ★ High Temperature Flexible Exhaust Connections
- ★ Single Seamless Welded Steel Hose
- ★ Braided, Reinforced, and Armored Hose



Write Dept. 24 for complete bulletin.



ECLIPSE AVIATION
SEAMLESS FLEXIBLE METAL HOSE
MANUFACTURED AND SOLD BY
DEPT. 24 PHILA. DIV. BENDIX AVIATION CORPORATION

INDICATION of the increasingly important part which the United States Coast Guard is playing in overseas military operations, and the still greater part which it will play in this sphere of war in the future, is the opening of a U. S. Coast Guard Mechanics Training Course on naval amphibious engines. The course is being given in the Detroit Diesel Engine Division School, which is a part of the General Motors Institute at Flint, Mich.

The admission of Coast Guardsmen to this new specialized course of training, a course formerly taken at the Detroit Diesel Engine Division School, only by Navy men, indicates also that there is imminent a sharp revision of the popular conception of where Coast Guard personnel are serving in the present world conflict. Time was when "Coast Guard" meant just what its name implies: guarding and protecting the coastal waters of the United States and its territories. Hereafter wherever invasion attempts are undertaken in any sphere of global warfare there one may expect to find men of the U. S. Coast Guard in action, manning and operating that newest and most unique instrument of modern warfare—the barge.

The Detroit Diesel Engine Division School at Flint is the only place at which Guardsmen are currently being trained in the mechanical maintenance of these barges. Known as the Amphibious Diesel Engine Course, it is in reality "post graduate training," since the only men who are selected to take it are either those who have already attended other Coast Guard engine schools or those who have had previous experience on Diesel engines.

New classes are started at the school each Monday. The course is of five weeks duration, the longest of any similar special course now being given at the institute. The students graduate as engine-room men qualified for service

aboard the smallest job is to functioning conditions countered landing is

The special sary by the landing ta of not one of engines phases has clude both power plan power. Ab quired for work; ten the laborato assemble an engines. T the servicing Motors cont



In the school there is room either side of

Most difficult Coast Guards tune-up test. upon to make repairs to a cramped space engine room tory equipment situation resul that which w called upon to on his automoder a bridge ta

The Detroit D established in 1939. The or school was to p service engine General Motor

aboard landing barges of all types, from the smallest to the largest. Their highly specialized job is to keep the powerplants of the barges functioning perfectly through whatever surf conditions or fire-power opposition may be encountered until the objective of a hostile coast landing is achieved.

The special length of the course is made necessary by the fact that the perfect execution of landing tactics requires mechanical knowledge of not one engine but a variety of various sizes of engines upon which modern warfare in many phases has come to depend heavily. These include both generating and propulsion Diesel power plants varying from 225 to 900 horsepower. About ninety per cent of the time required for the course is devoted to mechanical work; ten per cent to classroom lectures. In the laboratory the men learn to assemble, disassemble and repair these various types of Diesel engines. They also must become proficient in the servicing and maintenance of the General Motors controllable pitch propeller.



In the school "mock-up" as in the actual barges there is room enough only for one man on either side of the Diesel engines.

Most difficult and grueling of tests which the Coast Guardsmen must pass is the shipboard tune-up test. To pass this the student is called upon to make successfully numerous types of repairs to a Diesel engine in a simulated cramped space similar to that found in the engine room of a landing barge. The laboratory equipment used to create this simulated situation results in a condition comparable to that which would result if a layman were called upon to make a major overhaul repair on his automobile engine while crouching under a bridge table.

The Detroit Diesel Engine Division School was established in the General Motors Institute in 1939. The original purpose in founding the school was to provide training for civilian field service engineers in the maintenance of the General Motors Series 71 two-cycle Diesel en-

gine, then widely used in a variety of peacetime transportation, urban and farming activities. After Pearl Harbor, when there developed a vital need for Diesel engines as powerplants for tanks, an intensive training program for soldier-mechanics was inaugurated at the Diesel school. Later a special course was added for men of the Navy, and it is this latter course, considerably lengthened and refined, that the men of the U. S. Coast Guard are now taking over from the Navy.

New Exide Replacement Data Catalog of Heavy Duty Batteries

CONTAINING complete replacement battery data and other engineering information, a catalog of Exide batteries for heavy duty service is announced by The Electric Storage Battery Company, Philadelphia.

The book is divided roughly in two sections: battery service "on the highway" which includes trucks, trackless trolleys, buses, taxicabs,

BACHARACH'S COMPLETE INDICATING SERVICE

CAN HELP YOU GET
**MAXIMUM
PERFORMANCE**
FROM YOUR ENGINES

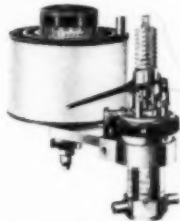
Designing and manufacturing engine indicators for every conceivable application is one phase of our complete indicating service. Another part of this service is the competent help of our trained engineering staff which is your assurance of an unbiased recommendation regarding the correct type of instrument for your particular requirements. A third phase of our service keeps you abreast of new developments in indicator design, application and practice in order to help you obtain maximum indicating efficiency and resulting maximum engine performance. The new literature listed below is for that purpose. Mark bulletins desired and return coupon.

BACHARACH
INDUSTRIAL INSTRUMENT CO.
7000 BENNETT STREET PITTSBURGH, PA.



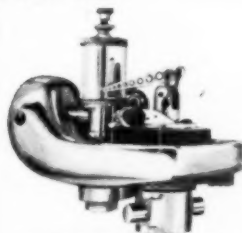
PREMAX INDICATOR

A simplified, direct-reading indicator that anyone can use to get accurate compression and firing pressure readings at any engine speed.



CHRONOMATIC DRUM

For pressure-time diagrams from medium speed engines with Type 2-CP Indicator shown above or from high speed engines with Type 4-HS Indicator shown below.



TYPE 4-HS INDICATOR

For indicating high speed engines on test floor and in the field. Ruggedness and ease of use are as important as its broad speed range.



ADAPTERS AND VALVE

Fittings designed for connecting indicators to every make of engine, including the latest Diesel automotive types.

SEND ME LITERATURE CHECKED

- ☐ Maintaining Diesel Engine Dependability
☐ Indicating H. P. from Pressure-Time Diagrams
☐ Complete Indicator Catalog

Name

Address

City State

We Operate

No. Cylinders Make of Engine

H. P. R. P. M.

hearses, fire apparatus, and ambulances; and, "off the highway" service which includes tractors, cranes, shovels, road-building machinery, excavators, logging apparatus, and compressors.

Illustrations of each of the various types of Exide Heavy Duty Batteries are shown with diagrammatic assembly layouts. Specifications—capacity, dimensions, etc. for each type are given with extensive battery replacement tables covering all makes of vehicles and other machinery using batteries.

Engineering information on the care of batteries is also a feature.

This 20-page book provides a most complete and handy reference book for those responsible for the servicing of heavy duty automotive vehicles and other gasoline and Diesel engine-equipped machinery.

A copy can be obtained by addressing a request to: The Electric Storage Battery Company, 19th Street & Allegheny Avenue, Phila.



Young

HEAVY DUTY RADIATORS

Triumph Over World's Toughest Service Conditions

Through trackless desert wastes and blinding sandstorms, the huge buses and freight units of the Nairn Transport Company have maintained regular schedules for the past ten years over thousands of miles of the world's toughest going. These Diesel powered cruisers, built by Marmon-Herrington, are equipped with YOUNG Heavy-Duty radiators . . . original equipment that is still in service combating the desert's searing daytime heat and windswept chill of night. Such unflinching service is typical of YOUNG Heat Transfer Equipment . . . designed and built by engineers with a

quarter-century of heat transfer experience. YOUNG units are noted for rugged performance and maximum cooling efficiency. Whatever your heat transfer problem may be, YOUNG products include a unit to handle it . . . equipment for heating and ventilating, cooling units for gas, gasoline and diesel engines, and aviation equipment that is in active service with Allied combat planes over a score of fighting fronts. Write for engineering details.

Young Radiator Company
Dept. 233F Racine, Wis., U. S. A.

Buy Bonds, Produce More, Salvage Scrap, Win the War.

Young

HEAT TRANSFER PRODUCTS
OIL COOLERS - GAS, GASOLINE, DIESEL ENGINE
COOLING RADIATORS - INTERCOOLERS - HEAT
EXCHANGERS - ENGINE JACKET WATER COOL-
ERS - UNIT HEATERS - CONVERTERS - CON-
DENSERS - EVAPORATORS - AIR CONDITIONING
UNITS - HEATING COILS - COOLING COILS



Latin-American Engineers Study REA

EIGHTEEN Latin-American engineers, in the United States to study Rural Electrification Administration activities, visited the Caterpillar Tractor Co. plant in Peoria, Illinois recently to discuss Diesel Engines and view demonstrations of "Caterpillar" Diesel-Electric Sets as part of their training.

The group was headed by Nick Martinez, Spanish assistant to Jack Levin, Consultant, Office of the Administrator, Department of Agriculture, St. Louis, Missouri.

The engineers' visit in Peoria was concluded by a reception and dinner in their honor with many "Caterpillar" officials attending. Following the dinner a talk on the subject of training given apprentices and engineering graduates was made by L. J. Fletcher, Director of Training.

The guests, in addition to Mr. Martinez, included: Roberto Acosta, Cuba; Jorge Arias, Guatemala; Alfredo Bebin and Manuel Depalo, Peru; Hector Cerna, Honduras; Federico Del Ponto, Argentina; Arturo Gantes and Carlos Palma, Chile; Mario Gil, Uruguay; Roberto Ladd and Vicente Ugalde, Mexico; Rene Moavia, Haiti; Jose Ordonez, Ecuador; Jose Rivas, Panama; Gabriel Rodriguez and Fernando Romero, Colombia; Jose Soto, Costa Rica and Jose Vilela, Brazil.

Mack Executive Offices Move to Empire State Building

PRESS of war work has forced removal of the executive offices of Mack Trucks, Inc. from quarters in the company's Long Island City plant into new offices in the Empire State Building. The move will take place on June 1st.

The new home offices in the Empire State Building will be on the 20th floor and will comprise 22,900 square feet of floor space. This marks the return of Mack to New York City after a seven year absence.

The move, according to Mack officials, will add thousands of square feet of much needed floor space in the Long Island City plant for the production of war materials, notably fire engines for the Army and Navy. Mack recently expanded its truck and marine engine production lines at Plainfield and New Brunswick, N. J. and at Allentown, Pa. by acquiring factories in and near those cities.

Report on Oil-Engine Power Cost for 1941

EXECUTIVES and engineers concerned with the problem of economic power supply for industrial plants will find authoritative and useful data on cost of operation of diesel engines in the Report on Oil-Engine Power Cost for 1941. This Report, compiled annually since 1929 by a subcommittee of the Oil and Gas Power Division, ASME, has become internationally known as an impartial and accurate source of information on such matters as fuel and lubricating oil consumption, and cost of supplies, maintenance, repairs, and supervision.

Covered by the report are 151 actual plants, giving complete operating cost figures on each, along with data on type of plant and equipment and conditions of operation. In addition,

production costs for 140 plants reporting for two or more years are given; 100 of these plants have reported for five or more years and 38 for ten or more. These long-term comparative costs offer an excellent picture of true average costs, usefully supplementing the figures for 1941.

Owners and operators of truck and bus fleets will find equally useful information in a section devoted to costs of diesel engines in automotive service. This section, representing the third annual survey, presents vehicle and engine data and costs received from 15 owners and operators of diesel-powered busses and trucks, covering 762 vehicles.

The Report is published by The American Society of Mechanical Engineers, 29 West 39th Street, New York, N. Y. Price \$1.25 (20% discount to members).

The Navy Needs Engineers

THE Navy has issued a call for qualified engineers to fill the new vacancies existing in research, development, inspection, operation, and maintenance of the Navy's mechanical equipment. The Navy's need for these mechanical

engineers who have training and experience in the fields of aeronautics and Diesel engineering is considered particularly urgent.

In this emergency, the Navy needs physically qualified men up to 50 years of age, who hold degrees in mechanical engineering and who have practiced in the field of engineering. In lieu of a degree, candidates should have ten to fifteen years' experience in the field of mechanical engineering, evidenced by proof of having had responsible charge of work and recognized standing in the profession. The Navy announced that men who have less than ten years' experience but who have successfully completed two or more years of college work leading toward an engineering degree also will be given consideration.

Qualified engineers are urged to apply for a commission at the nearest Office of Naval Officer Procurement. These offices are located in principal cities throughout the United States.

Roots-Connersville Announces New Bulletin on Victor Acme Pumps

BULLETIN 31-B-15 covering Victor-Acme positive displacement gas pumps has just been

Buckeye Diesels for Emergency Loads



Always ready on an instant's notice, Buckeye Diesels are widely employed as standby power units where quick-starting, rapid reaction to full load and long periods of continuous, economical performance are vital to essential services. Buckeye Diesels are designed and built to satisfy these conditions.

ENGINE BUILDERS SINCE 1908

Be Profitwise and Dieselize with Buckeyes
THE BUCKEYE MACHINE COMPANY LIMA, OHIO

LAST YEAR'S BONDS GOT US STARTED

THIS YEAR'S BONDS

ARE TO WIN!

★ Last year saw nearly 30,000,000 workers voluntarily buying War Bonds through some 175,000 Pay-Roll Savings Plans. And buying these War Bonds at an average rate of practically 10% of their gross pay!

This year we've got to top *all* these figures—and top them handsomely! For the swiftly accelerated purchase of War Bonds is one of the greatest services we can render to our country . . . and to our own sons . . . and our neighbors' sons. Through the mounting purchase of War Bonds we forge a more potent weapon of victory, and build stronger bulwarks for the preservation of the American way of life.

"But there's a Pay-Roll Savings

Plan already running in my plant."

Sure, there is—but how long is it since you've done anything about it? These plans won't run without winding, any more than your watch! Check up on it today. If it doesn't show substantially more than 10% of your plant's pay-roll going into War Bonds, it needs winding!

And you're the man to wind it! Organize a vigorous drive. In just 6 days, a large airplane manufacturer increased his plant's showing from 35% of employees and 2½% of pay-roll, to 98% of employees and 12% of pay-roll. A large West Coast shipyard keeps participation jacked up to 14% of pay-roll! You can do as well, or better.

By so doing, you help your na-

tion, you help your workers, and you also help yourself. In plant after plant, the successful working out of a Pay-Roll Savings Plan has given labor and management a common interest and a common goal. Company spirit soars. Minor misunderstandings and disputes head downward, and production swings up.

War Bonds will help us win the war, and help close the inflationary gap. And they won't stop working when victory comes! On the contrary—they will furnish a reservoir of purchasing power to help American business re-establish itself in the markets of peace. *Remember, the bond charts of today are the sales curves of tomorrow!*

You've done your bit  Now do your best!

THIS SPACE IS A CONTRIBUTION TO AMERICA'S ALL-OUT WAR EFFORT BY

Rex T. Friedman

Editor—DIESEL PROGRESS

THIS NEW CLUTCH



BRINGS THESE 12 ADVANTAGES



1. Simple in design and operation
2. Flexible control by air
3. No adjustments or oiling—low maintenance
4. Dampens vibration—absorbs shocks
5. Corrects misalignment automatically
6. Smooth starting—no jerks
7. Runs cooler—uniform pressure
8. Controls torque by air pressure
9. Greater capacity—more compact
10. Remote control by air valve
11. Replaces flexible couplings
12. Acts as clutch, slip-clutch, brake and coupling.

TO MANUFACTURERS OF



Heavy-duty Diesel drives, steel mills, presses, power shovels and cranes, oil-field equipment, compressors, hoists, motor generator drives, power take-offs—any heavy-duty service.

Many hundreds of AIRFLEX Clutches are in service in Diesel-powered Naval and Merchant Marine vessels.

You are invited to write for information to

FAWICK AIRFLEX COMPANY, INC., 9919 Clinton Road, Cleveland, Ohio

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

issued by Roots-Connersville Blower Corp. of Connersville, Ind. This six page folder in two colors contains many illustrations showing various types of driving arrangements which make these gas pumps readily adaptable to a wide range of industrial applications.

On the back cover appears a group of units offered by certain manufacturers who have incorporated Victor-Acme gas pumps into the specialized equipment which they build, and Roots-Connersville is making a feature of the

fact that by so doing "all operating parts and controls are located conveniently together."

Advantages in construction, claimed by the manufacturer, are discussed at some length, together with sectional views emphasizing the various features which are stressed. A diagram shows volume and power characteristics at constant and variable speeds.

One page is devoted to a selection table applying to both the type XA and XAS gas

pumps, covering a pressure range up to 6 lbs. Capacity covers a range from 5 to 700 CFM. Victor-Acme gas pumps are built of iron and steel in standard construction, but may be had in other metals to meet special requirements.

Copies of Bulletin 31-B-15 are available from the factory or various branch offices of the company on request.

Lefebvre Named President of Cooper-Bessemer

ANNOUNCEMENT of the election of Mr. Gordon Lefebvre to the office of president and general manager of The Cooper-Bessemer Corporation was released following the annual meeting of the board of directors of that company.

Mr. Lefebvre succeeds Mr. B. B. Williams, former president of Cooper-Bessemer, who will remain active in the corporation, continuing his duties as chairman of the board.



B. B. Williams

In his previous capacity as vice president and general manager of the company, whose two plants are located at Mount Vernon, Ohio, and Grove City, Pa., Mr. Lefebvre has been particularly active in helping Cooper-Bessemer reach its present high peak in the production of marine engines for the Navy and Maritime Commission, and stationary power units and compressors used by vital war industries. He has also been cited frequently for his efforts in building up friendly relations between labor and management, having co-operated closely with labor-management committees since their inception.

Mr. Lefebvre, who has been associated with Cooper-Bessemer for the past 19 months, is a

SAVE FUEL WITH GUIBERSON LIGHT WEIGHT DIESEL

POWER

IN TANKS • IN PLANES • IN SHIPS

ESTABLISHED 1919

 AMERICA'S ONLY
 RADIAL AIR-COOLED
 DIESEL ENGINE

The Guiberson with its amazingly simplified and efficient injection system uses only 26.2% as much fuel per hour as a gasoline engine of equivalent power. And every pound of fuel, although it costs only a fraction as much as high octane gasoline, gives 50% more power!

In planes, in tanks, and in light ships the extra power and extra range per pound of fuel of the Guiberson can spell the difference between reaching an objective or failure to complete a mission. For low-cost, dependable operation without fire hazard or radio interference, it's the Guiberson—America's only radial air-cooled diesel engine.

Guiberson U.S.A.

GUIBERSON DIESEL ENGINE COMPANY DALLAS, TEXAS THE GUIBERSON CORPORATION AIRCRAFT AND HEATER DIVISION

graduate of Virginia Polytechnic Institute and attended the United States Military Academy at West Point.



Gordon Lefebvre

His broad business experience includes apprentice and machine work for the Norfolk & Western Railway, after which he became affiliated with E. I. Dupont de Nemours & Co.

In 1919, Mr. Lefebvre joined General Motors Corporation where he was placed in charge of production at the Chevrolet plants under William S. Knudsen. Later he was elevated to the post of vice-president in charge of General Motors activities in Canada. He subsequently returned to the United States to assume charge of the corporation's Pontiac division. He was associated with American Locomotive Company in charge of the Diesel engine division prior to joining The Cooper-Bessemer Corporation.

As a member of the Joint War Production Committee of the Economic Defense Board, Washington, D. C., he contributed considerable time and effort towards coordinating the production of war materials in the United States with that of Canada.

Mr. Lefebvre's extensive knowledge of plant management and production and his valuable experience as an active member of the Society of Naval Architects and Marine Engineers have been especially helpful in permitting Cooper-Bessemer to reach their all-time production output which was doubled last year and is expected to reach even higher figures for 1943.

Army-Navy "E" to McQuay-Norris

THE Army-Navy "E" Flag was awarded to two divisions of the McQuay-Norris Manufacturing Company on May 5th. For the first

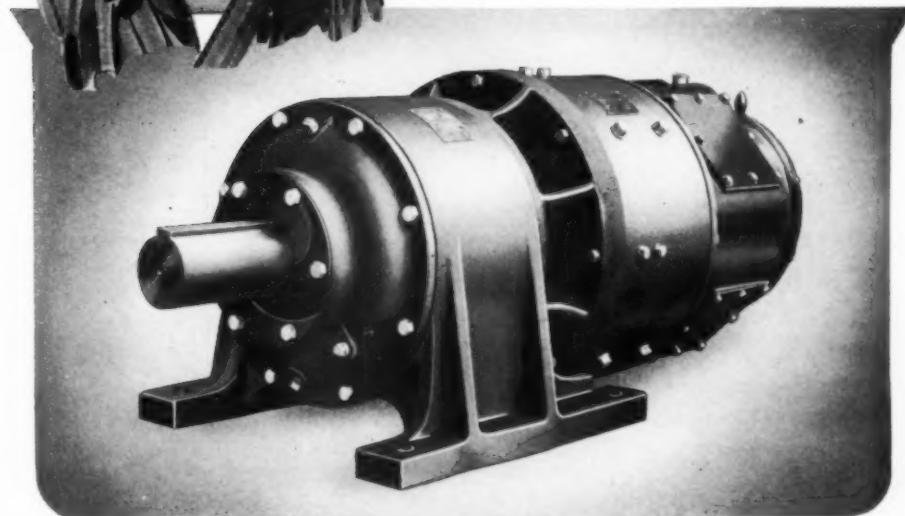
time in the St. Louis area, two ceremonies were held in a single day for one company. The E pennant was presented by Brigadier General J. Kirk, Chief of the Small Arms Ammunition branch of the Office of the Chief of Ordnance and the pins were presented by Lieutenant Commander Hugh MacMillan, Office of Naval Officer Procurement, St. Louis, Missouri. After the pins were awarded by Lieutenant Commander MacMillan, the actual affixing to the token employees was made by Staff Sergeant

Festy Seabolt, disabled in action in the Solomons, a veteran of twenty-six years Army service, and the wearer of six wound stripes from the first World War. The talk accepting the flag in the name of the Company and its employees was made by W. K. Norris, President of the McQuay-Norris Manufacturing Company.

The Army-Navy "E" award was given to the McQuay-Norris Mfg. Company for high quality



GUTS FOR A TOUGH JOB!



A Marine, wounded when his Raider Battalion exterminated the japs in the Solomons, recently told our employees how his Leatherneck buddies volunteered for Raider Service, even though warned that a large percentage of them would never return. That tough job required plenty of GUTS!

On another occasion, a concern which supplies us with a special high quality

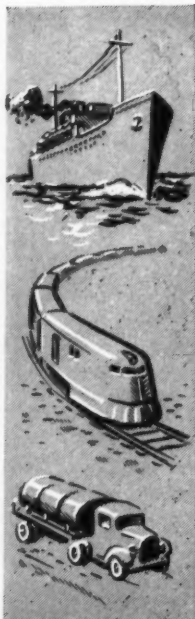
steel, asked us "where" and "why" that steel was put to use. We replied that it went into the shaft and gears because GUTS were required for a tough job.

When stamina is required for a war or peacetime job, Star's electrical equipment will pass the test. We specialize in making motor and generator equipment designed to meet YOUR electrical and mechanical requirements.



STAR
ELECTRIC MOTOR CO.
BLOOMFIELD, NEW JERSEY

A VAST ENGINE EXPERIENCE!

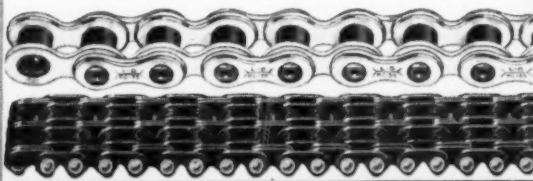


From years of close association with builders of engines, Link-Belt has gained an exceptional understanding of the problems of engine design and operation. As specialists in the use of chain drives, Link-Belt engineers have contributed many basic ideas for improvements in design and performance through applications of silent and roller chain drives. Builders and users of Diesel engines alike, are finding the active cooperation and assistance of Link-Belt engineers an important factor in the progress of this important source of power that has such great economic possibilities.

LINK-BELT COMPANY

Chicago Philadelphia Atlanta Dallas Indianapolis
San Francisco Toronto
Offices, warehouses, distributors in principal cities.

9132



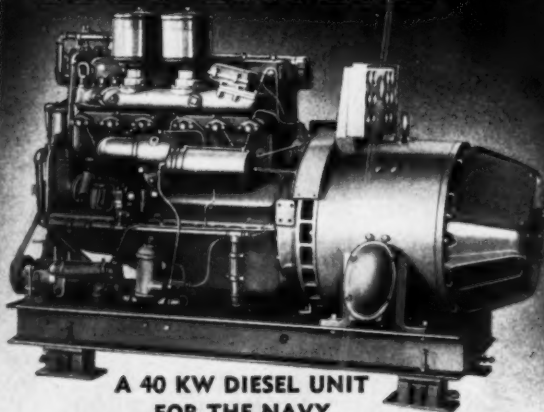
LINK-BELT Diesel

CHAIN DRIVES

SILENT AND ROLLER TYPES

LIFE SAVERS ... in War

COST SAVERS ... in Peace



A 40 KW DIESEL UNIT
FOR THE NAVY

U. S. Electric Plants in service throughout the far-flung battle fronts are, literally, life savers. For, modern warfare is "run" by electricity — telephones, radios, listening devices, search lights, automatic equipment. After the war, these powerful U. S. Plants will go back to their regular job of saving power and lighting costs for industrial and commercial users.

U. S. MOTORS CORP.
OSHKOSH, WIS.

U.S. DIESEL

ELECTRIC PLANTS

available. facilities. Consideration in making as well as quantity of production in the light of this award is also given to full utilization of available equipment; avoidance of stoppages; maintenance of fair labor standards; cooperation with the war program; effective management and engineering; record on accidents, health, sanitation, and plant protection; utilization of subcontracting facilities; and training of additional labor forces; and record of absenteeism.

Willis Named General Sales Manager of Sperry Gyroscope Company

HUGH WILLIS has been appointed to the position of General Sales Manager of the Sperry Gyroscope Company, Inc., according to an announcement made recently by R. E. Gilmore, president of the company, designers and producers of marine and aircraft instrument for the armed services. According to the announcement, Mr. Willis fills the post vacated by M. Lynn Patterson who died in an airplane crash last year.

Mr. Willis joined the Sperry organization in 1931. Previous to his new assignment, he was Chief Research Director in complete charge of the company's laboratory which employs more than 1500 technicians.



Mr. Hugh Willis, newly appointed general sales manager of the Sperry Gyroscope Co., Inc.

Upon graduation from Oberlin College, Mr. Willis became an assistant, then an instructor in Physics at Columbia University. His first position with the Sperry Gyroscope Company was head of the Research Laboratories in 1931. In 1937 he was appointed Chief Research Engineer—became Research Director in 1941, and Chief Research Director in 1942.

Peyton Power "Panc"

A Peyton-chaser on

IN the A published new, light-Diesel eng developed Laborator Division.

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Walter F. Representative

THE appoi trict Engine just been an & Co., Inc., Pohl will di sales activiti and South C making his h he was form

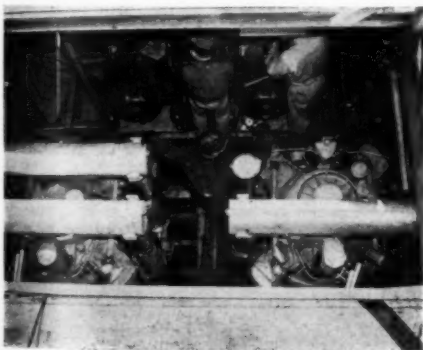
E. F. Drew

Peyton Builds Sub Chasers Powered With General Motors "Pancake" Diesels



A Peyton-built G-M Diesel engined submarine chaser on trial runs.

IN the August, 1942 issue, DIESEL PROGRESS published the first U. S. Navy release on the new, light-weight, high speed and high output Diesel engines known as the "Pancake" type, developed in the General Motors Research Laboratories and produced by Electromotive Division. Now The Peyton Company, Newport Beach, California are turning out 110 ft. sub chasers equipped with these lively Diesels and variable pitch propellers. Herewith are shown two General Motors "Pancake" Diesels being installed in a sub chaser also an action view of one of these guardians of the sea lanes. These photographs released by Navy and the Supervisor of Shipbuilding.



Here are seen two G-M "Pancake" Diesels being installed in a 110 ft. sub chaser.

Walter F. Pohl Appointed Representative of E. F. Drew & Co., Inc.

THE appointment of Walter F. Pohl as District Engineer for the Southeastern area has just been announced by officials of E. F. Drew & Co., Inc., American Colloid Division. Mr. Pohl will direct the company's servicing and sales activities in Alabama, Florida, Georgia, and South Carolina. Starting May 15th, he is making his headquarters at Atlanta, Ga., where he was formerly a resident.

E. F. Drew & Co., Inc. are manufacturers of

chemicals and oils, many of which are extensively used in the Diesel field. Mr. Pohl's experience and training in this line eminently fit him for his new position.

OWI Issues Handbook of Emergency War Agencies

A "Handbook of Emergency War Agencies," prepared by the Office of War Information, is a guide to Federal agencies all of whose present functions are devoted to the war activities.

It does not include the activities of the agencies established for other purposes, even though much of their work today has been integrated with the war program. The handbook is designed to help the public reach the services it needs within the emergency war agencies.

Copies of the handbook may be obtained by writing to Superintendent of Documents, Government Printing Office, Washington, D. C. Price 20 cents each.

FOR A GOOD START... MURPHY-DIESEL USERS CAN RELY ON GLOBE SPINNING POWER



The excellent performance of Globe Spinning Power Batteries in grueling wartime replacement service has led to widespread use for starting varied types of Diesel engines. They're doing that job, too — in a big way.

A Globe engineer will be glad to survey your needs and submit a recommendation. Address nearest factory.

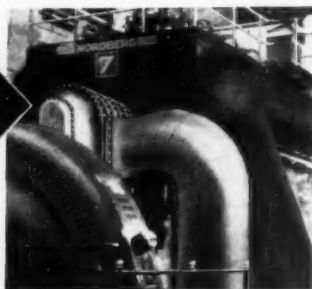
GLOBE-UNION INC. • MILWAUKEE, WISCONSIN
ATLANTA • BOSTON • CINCINNATI • DALLAS
LOS ANGELES • MEMPHIS • PHILADELPHIA • SEATTLE

DP-643

DIESELS at their best—

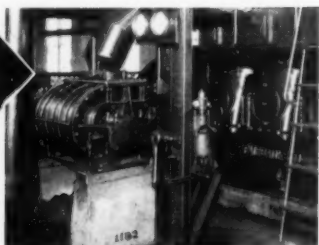
Important to NEW Installation Performance

Roots-Connersville Scavenging Blower of 14,000 C.F.M. capacity at 800 RPM, 2 3/4 lbs. pressure; installed on Diesel at Rockyville Centre, New York, municipal generating plant.



Improvement in OLD Installation Performance

Power output of this 4-cylinder Diesel, installed in a large ice plant, was materially increased by the addition of an "R-C" Scavenging Blower.



Roots-Connersville Positive Displacement Blowers are ideally suited for super-charging and scavenging applications due to their characteristics of positive air delivery, regardless of pressure variation. They have helped improve Diesel performance on many of the country's outstanding modern Diesel installations, as well as in modernization of old installations.

Data will be furnished without obligation, on blowers for your supercharging and scavenging problems. Even though priorities may delay procurement of new blowers, we will be glad to help you work out the details of your needs now—for future action.

**ROOTS - CONNERSVILLE
BLOWER CORPORATION**
306 Midland Ave. Connersville, Ind.

Supercharging and Scavenging
BLOWERS

ENGINE GENERATOR SETS

5 KW. TO 100 KW.

Duplex Truck Co.
Lansing, Michigan

Grant B. Shipley Elected Chairman of Elliott Board

HOWARD M. HUBBARD, president of the Elliott Company, manufacturers of power plant and process equipment, announces the election of Grant B. Shipley as chairman of the board of directors of the Company.



Grant B. Shipley

Mr. Shipley has had a long and successful industrial experience, having started in the shop as a mechanic, then progressing to draftsman, designer, construction engineer, chief engineer, sales engineer, manager. He organized several substantial enterprises, of which he was president and chairman. As an engineer he has been connected with shipbuilding, mining, wood preserving, power plant equipment, etc.

Mr. Shipley is a director of both The International Nickel Co., Inc. and The International Nickel Co. of Canada, Limited, and a member of the latter's executive committee, consultant to Koppers Company and others. His broad industrial, engineering, manufacturing and executive experience will be of value to the Elliott Company.

West Coast Diesel News

By JIM MEDFORD

THE 83-foot Van Camp Sea Food Company's seiner *San Francisco* built by the Peterson Boatbuilding Company, Tacoma, Washington, has a new 312 cubic inch Caterpillar Diesel installed for auxiliary service.

DIESELS have played a big part in the building of the new Alaska highway from powering road construction equipment to the hauling of supplies both by trail and sea. One of the latest marine Diesel installations for this service is in the 52-foot tug *Finch*—a pair of 150 hp. Grays.

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FOR service on inland waters of Alaska, four 66-foot Navy tugs are under construction by the Astoria (Oregon) Marine Construction Company. Power will be Buda-Lanova Diesels.

THE Maritime Shipyards, Seattle, Washington, have under construction a number of 105-foot Army barges of wood construction all of which will be powered with twin Caterpillar Diesels with 3-to-one Twin Disc reduction gears.

THE second 186-foot all-wood construction Navy salvage vessel has been launched by the Bellingham (Washington) Marine Railway and Boat Building Co., and keel for the third has been laid. Power is four Cooper-Bessemer Diesels with General Electric generators direct connected for Diesel-electric drive.

UNDER construction for the U. S. Engineers by the Pacific Boat Building Co., Tacoma, Washington, is a 96-foot tug to be powered with a pair of 550 hp. Cooper-Bessemer Diesels from designs by Seattle District naval architect O. A. Quigley.

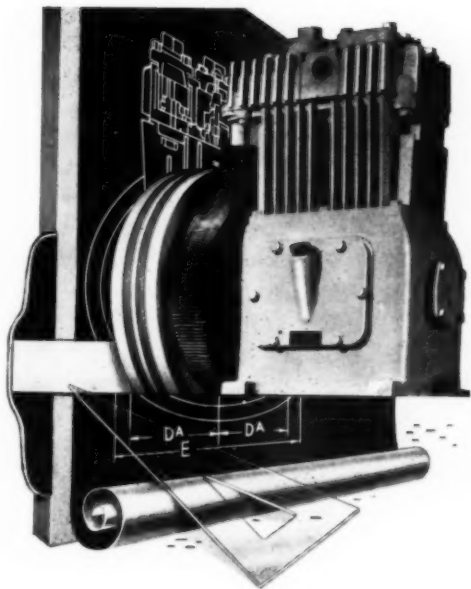
INSTALLATION of twin Wanderer 6-cylinder, 7" by 8½" Waukesha-Hesselman Marine engines in the new 63-foot all-steel river tug *Lew S. Russell* by the Russell Towing Company for Columbia River service has resulted in a loaded speed of ten knots, according to owners.

MARINE installation reported by the Los Angeles office of Fairbanks-Morse Co., include a 30 hp., 1200 rpm. auxiliary Diesel in the French Sardine Co.'s seine boat *Cesare Augusta* of San Pedro, California.

SOUTHERN California distributors, Shepherd Tractor and Equipment Co., Los Angeles, California, report installations of Caterpillar Marine Diesels, in the Castagnola Sea Food Co.'s Pelican and Santa Lucia, Santa Barbara, California.

CONSTRUCTION of concrete barges at National City, California, has progressed to the point of requiring twelve additional Cummins Diesel-electric generating sets for auxiliary service, pumps, etc. These are 75 hp., 40 kw. units, compactly mounted.

BEESON Brothers, Los Angeles, California, report the sale and installation of a 160 hp. Chicago Pneumatic Diesel direct connected to 125 kva General Electric generator by the Shoshone Mining Company at their Death Valley lead mine.



1st in Design

"TOPS" IN DEPENDABILITY

QUINCY was the first to design an air compressor that combined modern appearance with improved mechanical features. Construction is simpler. Radiation area is increased 12%. Lubrication is more thorough—more positive. Quincy builds air compressors exclusively. This policy of specialization has made the name "Quincy" a symbol for dependability. Quincy Compressors provide air for Diesel starting and other services requiring intermittent pressures up to 500 lbs. per sq. inch. If you have compressed air problems, let our specialists help you solve them!

Quincy
COMPRESSORS

QUINCY COMPRESSOR CO., Dept. K-6 • QUINCY, ILLINOIS

**DIESELS
ARE DOING MORE
JOBS BETTER!**

In industry, transportation, public utility and other fields where maximum power and minimum operating cost are required, diesels are doing more and more jobs and doing them better . . . And helping them do it is HALL Valve Servicing Equipment . . . Terrific heat and extremely high compression require perfect co-ordination between valve face and valve seat. By providing finer, longer lasting precision and finish the HALL Diesel Type ECCENTRIC Valve Seat Grinder and Wet Type Valve Refacer shown here keep diesel valve performance at its highest efficiency . . . Even though this equipment may not be readily available for the duration, it will pay you to get complete information on it RIGHT NOW!

The Hall Manufacturing Co., Toledo, O.

HALL

FOR VICTORY
Buy U. S. War Bonds

CRACKED BLOCKS! CRACKED HEADS!

Repaired for Life
by the



MECHANICAL METHOD

★ There are no comebacks when you use the K & W Mechanical Method. You do the job once, and that's the end of it . . . for good! Every K & W repair is *guaranteed for the life of the motor*.

Distortion cracks, freeze cracks and heat cracks, in heads, blocks and crankcases . . . this revolutionary method repairs them all . . . *permanently*.

Many motor manufacturers recommend this improved method of cold welding. Hundreds of bus, truck and tractor operators use it regularly on every type of diesel and gasoline motor.

In most localities there's a licensed K & W Repair Station, equipped to give you fast, efficient service. If service is not available in your locality, the work will be done at our Factory Service Division, Bloomington, Indiana.

Your jobber will give you complete details, or you can write direct to us.

★ Operators maintaining their own shops can obtain a license under K & W patents to handle their own repairs. Mechanics of licensees are trained free of charge by K & W Service Engineers.



KERKLING & COMPANY, INC.
BLOOMINGTON, INDIANA

Manufacturer of K & W Metallic Seal and
Licensor of K & W Mechanical Method

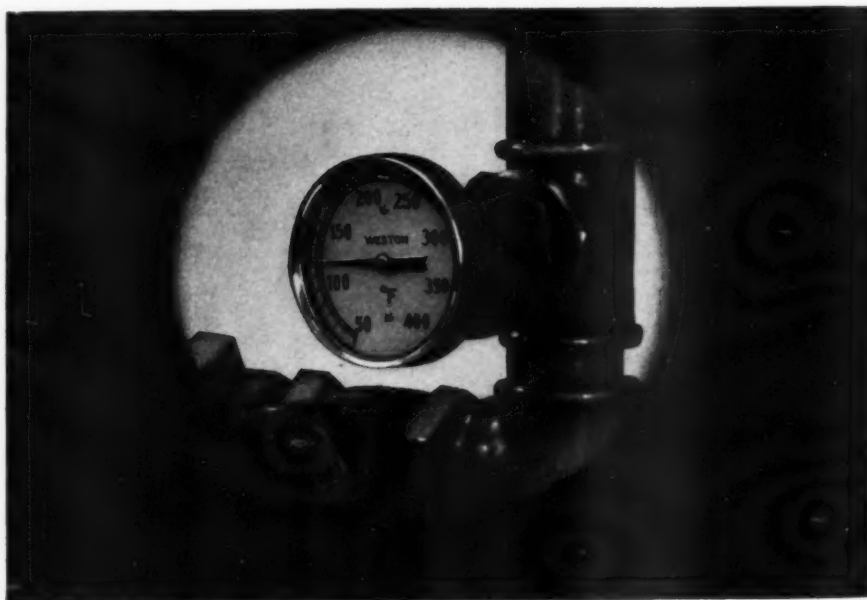
A pair of 125-hp Cummins Diesel have been selected by the Star and Crescent Boat Company of San Diego, California, for placement in their new 64-foot bay ferry now building at the San Diego Construction Company.

THE 105-foot tuna clipper *Magellan* of the Franco-Italian Packing Company, Terminal Island, California, has installed a 4-cylinder, 70-hp Atlas Imperial Diesel driving a General Electric generator and compressor.

THE new Stockton, California, yard of the Clyde Woode Shipbuilding Company has commenced work on ten army tugs of the utility type. They are 96 feet long with 450 hp. Fairbanks-Morse Diesel propulsion engines.

INSTALLATION of two 5½" by 7", six-cylinder, 114 hp. at 1200 rpm. Superior Diesels with Twin Disc gears is being made in an 80-foot power scow for freight service in Alaska waters by Pettrich Machine Works, Seattle.

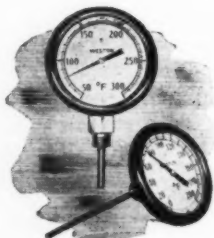
EASY ON THE EYES!



Ruggedness and dependable accuracy, too, distinguish the ALL-METAL THERMOMETER

Readability in an indicating thermometer is an outstanding advantage if full dependence can be placed on each reading. Thus the WESTON thermometer has been widely adopted throughout the process industries: because it provides both these essential factors . . . readability and dependability . . . without compromise. It's simple, all-metal temperature principle . . . minus gases, liquids, capillary and involved mechanisms . . . assures "on-the-dot" accuracy over a far longer period of time. In addition, this all-metal construction safeguards against failures due to vibration or over-ranging. *You're more certain of your reading . . . with a WESTON.*

WESTON all-metal thermometers are supplied in types and diameters for most industrial applications and in stem lengths from 2½ to 24". Accuracy, over the entire scale, guaranteed within 1% for the industrial models . . . ½ of 1% for the laboratory model. Literature gladly sent on request, although production facilities are at present devoted solely to the war effort. Weston Electrical Instrument Corporation, 579 Frelinghuysen Avenue, Newark, New Jersey.



WESTON All-Metal TEMPERATURE GAUGES

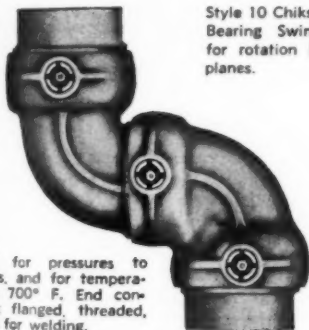
*Flexibility
that cushions*

VIBRATION

CHIKSAN Ball-Bearing Swing Joints are recognized as the effective means for absorbing vibration and providing necessary flexibility with the safety of steel on fuel, water, lubricating, starter and soot-blower lines on Diesel Engines . . . on land and at sea.

FLEXIBILITY NOT AFFECTED BY VIBRATION UNDER PRESSURE

CHIKSAN Swing Joints are ideal for these purposes because they are not affected by vibration under pressure. Smooth, easy turning is provided by double rows of ball bearings. There is nothing to shake loose . . . nothing to tighten or adjust. Pack-off is so efficient that the same lines can be used for both suction or pressure service.



Style 10 Chiksan Ball-Bearing Swing Joint for rotation in three planes.

Applied for pressures to 3,000 lbs. and for temperatures to 700° F. End connections: flanged, threaded, or bored for welding.

EASY TO BUILD FLEXIBLE LINES THAT ARE PERMANENT

With Chiksan Swing Joints, you can build your own flexible lines in any size from 3/4" to 12" in diameter, or larger. Eight different styles provide full 360° rotation in 1, 2 and 3 planes. Over 500 different Types, Styles and Sizes for pressures to 3,000 lbs. and temperatures to 700° F.

Write for Engineering Data. Address Dept. DP:

CHIKSAN REPRESENTATIVES
IN PRINCIPAL CITIES
DISTRIBUTED NATIONALLY BY CRANE CO.

CHIKSAN TOOL COMPANY
BALL BEARING SWING JOINTS
for ALL PURPOSES
BREA, CALIFORNIA

SKF Appoints Robert R. Zisette General Sales Manager

THE appointment of Robert R. Zisette, as general sales manager of SKF Industries, Inc., Philadelphia manufacturers of ball and roller bearings, has just been announced by Richard H. DeMott, vice-president in charge of sales.

The degree of Mechanical Engineer was conferred upon Mr. Zisette by Yale University in 1921. In September of that year he started with SKF. After one year in engineering and sales departments, he became sales engineer in the Cleveland office. He remained in this position for seven years, then was promoted to district manager of the Cincinnati office.

On June 1, 1942 he was promoted again, this time to the office of assistant sales manager.

Alden M. Hammond

ALDEN M. HAMMOND, 42, senior partner of the Hammond-Goff Company, Providence, R. I., advertising firm, died Sunday, April 11, 1943, at his home following two years of ill health. He was a prominent churchman, particularly interested in religious education.

Mr. Hammond was born in Wallingford, Conn., son of the late Rev. F. H. L. Hammond and Mrs. Hammond, of New Haven, Conn. He graduated from Massachusetts Institute of Technology in 1922.

After a short period with the Terry Steam Turbine Co., Hartford, Conn., he went to the Whitlock Mfg. Co. of Hartford, Conn., and in 1925 became advertising manager of this firm. In 1927 he became advertising manager of Builders Iron Foundry, Providence, R. I.

In 1932 he organized the Alden M. Hammond Industrial Advertising and Marketing Agency. Through this organization he was advertising counsel for Builders Iron Foundry, Proportioners, Inc., Kinney Mfg. Co., Whitlock Mfg. Co., Abrasive Machine Tool Co., Standard Machinery Co., and American Emery Wheel Works for a period of years.

Early this year he formed, with Carleton Goff as partner, the Hammond-Goff Co., Industrial Advertising and Marketing Agency, and was the active head of this Agency at the time of his death. His partner, Carleton Goff, will continue the Hammond-Goff Co. which will continue to serve the same group of clients.

PRECISION BUILT DEMCO FUEL INJECTION EQUIPMENT

Demco design, manufacture and test are based on the ultra-precise requirements of effective Diesel fuel injection. Demco fuel injection units are characterized by compactness and clean, simple design, highest quality materials, superb workmanship.



Demco Fuel Nozzle

Nozzles are made in three sizes, with flat seated needles of standard or non-corrosive materials. No. 4 nozzle is self-cooling.



Demco Fuel Injector

Fuel injectors are hydraulically operated, differential, closed type and are made in various lengths with three standard shank diameters.



Demco Fuel Injection Pumps

"PH" fuel injection pumps are port controlled type; they are adaptable to a wide range of Diesels with minor adjustment of timing.

Send specifications with inquiries

**DIESEL ENGINEERING
& MANUFACTURING COMPANY**

200 214 N. LAFLIN ST., CHICAGO, ILLINOIS

Highest Quality Gaskets & Oil Seals by **FITZGERALD**

**Gasket Craftsmen
for 37 Years**

Gaskets of all types and materials to give reliable service under all Diesel operating conditions.

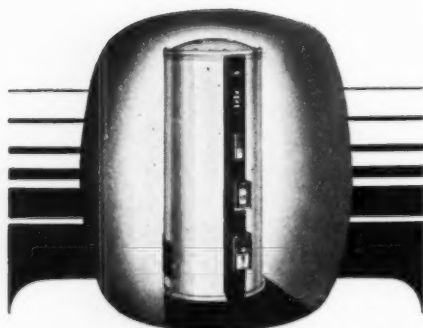
For full information write ~

**THE FITZGERALD MANUFACTURING
COMPANY**

TORRINGTON, CONN.

Branches: Chicago, Illinois, Los Angeles, California
Canadian **FITZGERALD, Limited, Toronto**

**FITZGERALD
GASKETS**
THE COMPLETE LINE THAT COMPLETELY SATISFIES



**THERE IS NO SUBSTITUTE FOR
EFFICIENT OIL PURIFICATION**

Oil purification to be efficient must:

1. **Be Direct Connected**—Oil must be purified while in operation.
2. **Continuous in Operation**—Contamination must be removed as fast as it is liberated.
3. **Remove All Types of Contamination**—Acids, lacquers, sludge as well as abrasives and dust.

HONAN-CRANE CORP.
LEBANON, INDIANA

**DIESEL ENGINES
AMERICAN LOCOMOTIVE CO.**
DIESEL ENGINE DIVISION
AUBURN • NEW YORK

THE 32-foot fishing boat *Northwest* owned by Jim Avery and Joe Castagnola of Santa Barbara, California, has been repowered with a new Caterpillar 3 $\frac{3}{4}$ " by 5", 221 cubic inch displacement marine Diesel with Twin Disc reduction gears.

THE awarding of the Maritime Commission "M" pennant to the Washington Iron Works, Seattle, Washington, in April, came at a time when they were celebrating their half-century of progress. One of the oldest iron works on the coast and manufacturers of the Washington Diesel engines, President Gerald Frick accepted the award on behalf of the company.

THE main power plants of the new 96-foot tugs under construction by the Puget Sound Boat Building Corp., Seattle, Washington, are 8-cylinder, Cooper-Bessemer Diesels rated 675 hp. each at 400 r.p.m. Equipment includes Alnor pyrometers, Maxim silencers, and Edison storage batteries. They are for the U. S. Engineer Corps.

A NEW 4 $\frac{1}{2}$ " by 5 $\frac{3}{4}$ ", 100 hp. at 1600 r.p.m. Superior Diesel engine has been selected by Captain Kaltenback to repower his 50-foot yacht *Zarac* of Newport Beach, California. Three-to-one Joes gears are part of the installation.

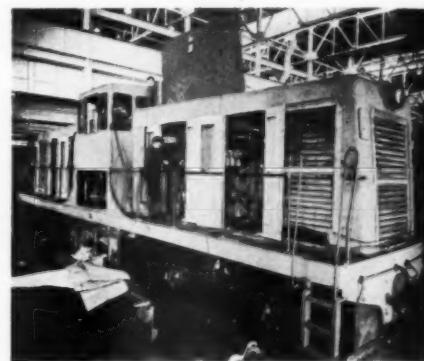
AT Garbutt and Walch yard, Terminal Island, California, a new workboat is being repowered with a 6 $\frac{1}{2}$ " by 8 $\frac{1}{2}$ ", 6-cylinder, 100 hp Lorimer Diesel, direct-reversible and with Morse reduction gear.

**OUR 81ST YEAR
PICKERING GOVERNOR CO.
PORTLAND, CONN.**

AT Craig's Long Beach, California, shipyard, the 118-foot tuna clipper *Southern Cross* is replacing two smaller Diesels with a 150 hp. Fairbanks-Morse auxiliary Diesel direct connected to a 75-kw Westinghouse generator.

ANOTHER recent marine Diesel installation reported by the Shepherd Tractor and Equipment Co., Los Angeles, California, is a Caterpillar 468 cubic-inch, 60 hp. engine equipped with a Burgess snubber, in the 45-foot fish boat *Sea Maid* owned by Guy Thompson.

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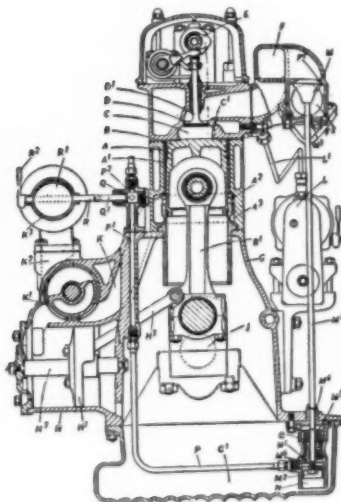
Latest Diesel Patents

A description of the outstanding patented inventions on Diesel and Diesel accessories as they are granted by the United States Patent Office. This information will be found a handy reference for inventors, engineers, designers and production men in establishing the dates of record, as well as describing the important Diesel inventions.

Conducted by C. CALVERT HINES*

2,288,326

INTERNAL COMBUSTION ENGINE
Harry Ralph Ricardo, London, England.
Application May 21, 1940, Serial No. 336,450
In Great Britain June 1, 1939
20 Claims. (Cl. 123-65)

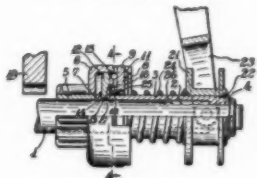


8. In an internal combustion engine operating on the two-stroke cycle with compression ignition, the combination of at least one valve-controlled exhaust port through which the exhaust gases pass from the cylinder into an exhaust manifold and thence through an opening to the atmosphere, a member mounted adjacent to the said exhaust gas outlet opening and movable into positions wherein it will obstruct in some degree the outflow of exhaust gases through the said opening, a cylinder with a piston movable therein and connected to the said gas-obstructing member, a spring acting on the said member to move the piston and the member in a direction which will cause the member to obstruct the exhaust gas outflow, and a pipe connection between the engine lubricating system and the said cylinder through which piping oil under pressure can act in the cylinder on the piston and move it and the said gas-obstructing member in a direction opposite to that in which it is moved by the said spring thereby reducing the obstruction to the gas outflow as set forth.

2,305,219

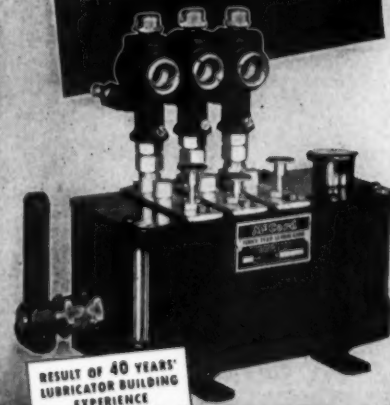
ENGINE STARTER GEARING
Burr W. Jones, Elmira Heights, N. Y., assignor to Bendix Aviation Corporation, South Bend, Ind., a corporation of Delaware
Application October 31, 1940, Serial No. 363,693

6 Claims. (Cl. 74-6)



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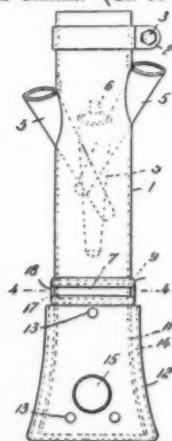
1. In an engine starter, a power shaft, a sleeve slidably but non-rotatably mounted thereon, a clutch member fixed on the sleeve, a pinion slidably and rotatably mounted on the power shaft, a second clutch member, means connecting the second clutch member to the pinion for rotation therewith, a yielding spiral member on the sleeve having an inclined connection with the second clutch member, and means for applying endwise pressure to the yielding spiral member for moving the sleeve along the shaft.

2,308,059

EXHAUST DEVICE FOR INTERNAL COMBUSTION ENGINES

Ammiel F. Decker, Pelham, N. Y.

Application April 3, 1941, Serial No. 386,675
12 Claims. (Cl. 60-30)



1. An attachment for the exhaust tail pipe of an internal combustion engine or the like, comprising a tubular body having a substantially straight through central passage therethrough, and a plurality of flaring air intake tubes assembled about the side walls of said tubular body, the larger parts of said tubes extending outside of said body, for conducting air into the tubular body to mix with the exhaust gases.

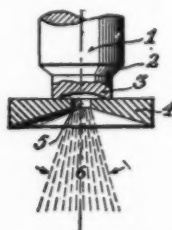
2,305,801

NOZZLE ASSEMBLY FOR DIESEL MOTORS

Paul Wiebcke, Nuremberg, Germany; vested
in the Alien Property Custodian

Application August 21, 1940, Serial No. 353,554
In Italy September 4, 1939
1 Claim. (Cl. 299-107.6)

A nozzle assembly for high-speed Diesel motors, including a disk having a single central aperture of uniform diameter throughout, a needle having its end wall formed with a flat peripheral portion and a central concavity, said



flat peripheral portion normally having a flush fluid-tight contact with the face of the disk surrounding the aperture therein, said needle upon actuation by pressure of fuel away from the disk compelling fuel to pass from the space surrounding the needle tip into the said concavity to effect atomization of fuel therein preliminary to forcing the atomized fuel through the aperture in the disk in the form of a uniform concentrated spray jet approximating a 20° to 30° cone whose apex lies inwardly of the mouth of the said aperture.

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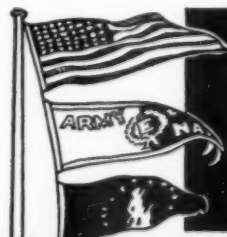
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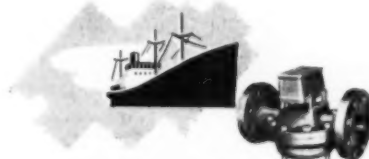
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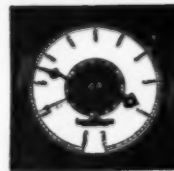
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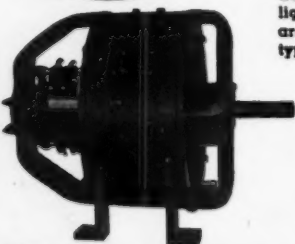


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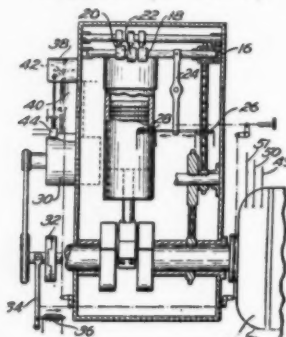
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2,235,710
INTERNAL COMBUSTION ENGINE AND
METHOD OF OPERATING THE SAME
Roy E. Hoffmann, Springfield, Ohio, assignor
to The National Supply Company, Pitts-
burgh, Pa., a corporation of Pennsylvania.
Application July 15, 1939, Serial No. 284,718
3 Claims. (Cl. 123-75)

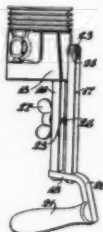


2. In an oil engine, a piston, a cylinder provided with intake and exhaust valves and a fuel valve, a set of cams for operating said valves on a four-stroke cycle, a source of compressed air for supercharging the engine for abnormal operation, a second set of cams spaced axially from said first set and operable to increase the period during which both said inlet and exhaust valves are opened simultaneously, means to render one or the other set of said cams active, means to connect said source of compressed air to the engine, said last means being synchronized with said cam shifting is connected whenever said second set of cams means whereby said source of compressed air is made active.

2,289,941

METHOD OF EXPANDING PISTONS

Harold K. Switzer, Newport, Ky.
Original application August 3, 1940, Serial No.
350,426. Divided and this application April
17, 1941, Serial No. 389,045.
10 Claims. (Cl. 80-5)



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